Identifying the True Military Factor in RNZAF Training

A Thesis

submitted in partial fulfilment

of the requirements for the Degree

of

Master of Education

in the

University of Canterbury

by

M.V. Simons

University of Canterbury

1997

Disclaimer

The views expressed this document are those of the author and do not purport to reflect the position of the Ministry of Defence, New Zealand Defence Force, the Royal New Zealand Air Force, nor the University of Canterbury.

Language

Terminology contained in this document reflects the contemporary language of the New Zealand military at the time of writing. Every effort has been made to maintain the flow of the thesis. While certain phrases may appear gender specific or culturally insensitive to some, they have been used in context with the military culture. Quotes from other authors have also been made verbatim. Explanations of unusual terminology have been offered where appropriate and a glossary is provided in Appendix A.

Acknowledgements

The author wishes to thank the many people who contributed to the compilation of this thesis:

The staff and students of the various RNZAF Schools who were very helpful during the data gathering phase.

The numerous proof readers and commentators who assisted throughout the study with their suggestions and thoughts.

And in particular, David Hughes and Alison Gilmore for both their time and commitment as the project supervisors.

Authority to release information from the MOD Audit Report was granted, through Air Staff, by the Ministry of Defence.

List of Contents

List of Tables

Appendix B

Appendix E

List of Figures

Abstract

This thesis seeks to identify both the existence and cost of the military factor in RNZAF training. In the past, educational evaluation teams have had difficulty in assessing the efficiency of RNZAF training because no clear definition has existed for this uniquely military element. This thesis attempts to define the term by dissecting the popular use of the phrase into three separate parts: the true military factor, the corporate factor and inefficiencies. The true military factor is defined as the component of RNZAF training that inculcates the military culture in students during formal training. This culture is further refined to focus on the teaching of institutional values. The corporate factor however, refers to the selected methods and standards employed by a training provider. Instead of the military factor, it was hypothesised that the corporate factor represented the greatest cause for the cost difference between the RNZAF and civilian training providers. Based on the findings of overseas research, the thesis goes on to consider the possibility that the military factor may in fact be self-selected, rather than inculcated. To investigate this hypothesis, the study uses an established instrument to assess student attitudes of loyalty. To test whether the RNZAF self-selects pro-military attitudes, the study compared the scores of new recruits with the scores of serving personnel. To test whether the RNZAF inculcates pro-military attitudes during formal courses, the study compared students' pre- and post-course scores. The study found that only minimal increases in attitudes were evident as a result of formal courses and that no significant difference was found between recruits and serving personnel. In addition to those two investigations the thesis goes on to develop a spreadsheet model for optimising corporate factors and minimising inefficiencies. Although this model is functional in its present form, future developments will further enhance its potential. The study concludes that the RNZAF self-selects pro-military attitudes and, with the exception of recruit courses, does not teach them. The thesis argues that the military factor represents only a minimal part of RNZAF training.

Keywords:

Military Values, Institutionalism, Occupationalism, Self-Selection, Inculcation

Chapter 1

Introduction

The term 'military factor' is a phrase used to describe any behaviour deemed unique to the armed forces. This behaviour can include anything from specific duties through to the intangible elements of the military culture. Recently the term was used by the Ministry of Defence (MOD) in an audit report which reviewed training at Royal New Zealand Air Force (RNZAF) Base Woodbourne.[1] The major finding of the study was that military training costs far more than similar civilian-run courses. It attributed some of the cost difference to 'the military factor' but implied that the remaining difference indicated huge inefficiencies in the RNZAF's training system. Because the military factor remains undefined, it is difficult to determine how large those inefficiencies are.

The MOD report recommended that the RNZAF seek alternative providers for all their training needs (excluding recruit and core military courses). The RNZAF however, argued against this recommendation on the grounds that the military factor played an important part in all courses.[2] It was claimed that graduates of military institutes are instilled with a work ethic and set of values that cannot be gained elsewhere. The implication of this view is that civilian training would result in a decline of traditional military values.

The military factor appears to be an expensive yet important element of RNZAF training. Until it can be quantified however, its value for money will remain difficult to measure. While some disagreement remains, both the RNZAF and MOD agree that the subject requires further review.

In an attempt to calculate the cost benefit of the military factor, this study investigates the following two key issues:

a. Effectiveness: What component of military courses is the military factor? and

b. Efficiency: What is the real cost of that component?

---

[1] MOD Audit Report Number 83, released 1994.

[2] Barnes (1994).

Before measuring its existence and cost, it is necessary to fully understand what constitutes the military factor.

The term 'military factor' has, at times, been used to describe the difference between civilian and military training, this 'factor' being the component of military culture inculcated through training. In effect, this refers to two different approaches of training management, yet until now, it has has only been measured by the variation in operating costs per enrolling student.[3] Such differences in costs however, result from more than just the cultural differences between the two types of institutions. There is also the question of quality. This thesis proposes that the cost variation should in fact be attributed to three distinct categories: the Corporate Factor, the True Military Factor, and Inefficiencies.

The Corporate Factor

The corporate factor represents the self-imposed methods and standards of training which the RNZAF has chosen to employ. Examples of these include small class sizes, low staff student ratios and high quality training aids. The elements that make up the corporate factor reflect the professional nature of the military although, in theory, they could be provided by any training institute. The reason skepticism is maintained when suggesting a civilian institute could offer the same standard is that there is no known civilian institute which currently employs the RNZAF's training philosophies. The incongruent philosophies are due to several fundamental differences between military and civilian training institutes:

1. For civilian institutes, the student is the customer, whereas the military is its own 'end user'. Because the RNZAF is paying its students, and will remain their employer after graduation, it has a vested interest in maximising pass rates and grades. There is also an urgency to minimise the length of courses and maximise the learning per day. Civilian courses on the other hand, are funded relative to the course length and their daily contact time is moderated to meet the students' needs.

[3] The method of evaluation employed by the MOD Audit and Assessment Report was based on the Equivalent Full Time Student (EFTS) system of performance indicators.

2. The RNZAF places greater importance on permanency of learning and minimal post-graduate conversion training.

3. While 50 per cent might be an acceptable standard in civilian industry, or at school, it is unacceptable in an industry where lives are at stake. RNZAF courses use a variety of standards varying between 70 and 100% as the minimum pass grade. After all, nobody wants to fly in an aircraft if only half of the repairs were performed correctly.

Corporate factors play a significant part in any business, as they not only save money, but they also influence quality control and professionalism. The maintenance of high standards has a flow-on effect in pride and intrinsic motivation. This element is common with the aims of any large company in business.

Elements of the corporate factor may be expensive to retain, but this need not be the sole reason for disbanding the military training system in favour of a civilian alternative. A civilian institute accepting a lower standard of training will no doubt operate at a lower cost, just as the military could if it chose to throw away such self-imposed limitations. As yet however, the military has chosen not to do away with any of these standards as their loss could easily cause subsequent problems such as time or material wastage, damage to equipment, failure to achieve missions or even personal injuries - including loss of life.

The True Military Factor

The true military factor (hereafter simply the 'military factor') is a term used to describe the component of training which teaches, or instils, military values in trainees. The subject of military values is extremely complex and is covered in more depth in the next chapter. The following is a brief overview to introduce the subject.

The types of values associated with the military include duty, honour, loyalty and honesty. They are not, by any means, unique to the military. They duplicate the values espoused by many large

business organisations (the 'IBM way' and the 'Nissan way') as well as churches and clubs. They have been associated with the military longer than civilian organisations simply because for most of history, militaries have been one of the few large cohesive units in existence.

The association of selflessness and the military has long been established and has been sensationalised through legends of noble feats and acts of bravery. Perhaps the greatest difference between the military and corporate businesses of today is the extent of devotion - being prepared to die.

The traditional view on military values is that they are instilled over a long period of time. Initially, during recruit training, new members are immersed in an intensive programme which transforms them into military personnel. The instillation of military values is strongly reinforced during such courses and it is assumed that they continue throughout the individual's service career. While this process may in fact occur, chapter two discusses why it lacks support in the academic literature.

Inefficiencies

The RNZAF has its own way of assessing inefficiencies and in deciding the best way to improve. Some of the more formal methods involve trade reviews and unit improvement teams. Despite the presence of these systems, it is accepted that certain limitations will allow inefficient policies or procedures from time to time. One such limitation is economies of scale, particularly when the RNZAF becomes too small to efficiently run its own courses.

The Aim of This Study

The original aims of this study were to :

a. Define the Military Factor,
b. Assess what components of RNZAF training constitute the Military Factor, and
c. Identify the cost of providing the Military Factor.

To do this, the study began with a literature review to define what the military factor really is. Having determined what is meant by the term military factor, the study then set out to measure its existence and source. Specifically, an investigation was made to assess the degree to which the RNZAF inculcates or self-selects its culture. The intention was then to measure the cost of the military factor by comparing civilian and military training providers. Because the study found insufficient evidence to support the claim that the military inculcates its culture during formal training, the original hypothesis became void. Further complications were also encountered with publishing commercially sensitive information about civilian training organisations. As a result, the model that was initially designed to compare civilian and military institutes was adapted to compare military courses with themselves. The model provided a tool for analysing corporate factors in terms of their cost effectiveness and therefore it became a vehicle for minimising inefficiencies.

Chapter 2

Literature Review

This chapter has been divided into three sections. The first section seeks to define the true military factor. The second section reviews research in the field of military values and their measurement. The final section identifies the difficulties associated with separating inefficiencies from corporate factors.

2.1 Defining the Military Factor

The military factor referred to in this study relates to the inculcation of the military culture in students during formal training. Although measuring a culture is quite difficult, assessing how well it is taught is even harder. Before it can be quantified and measured, it must be thoroughly analysed.

Since the publication of Huntington's *Soldier and the State* [1] numerous authors have contributed to the understanding of military cultures. The most prominent however, has been Charles Moskos who became the world authority on military values and their development following his landmark theory in 1977.[2] This theory provides a continuum along which a military can be placed to indicate its commitment to traditional military values.[3] One end of this continuum has been labelled institutionalism while the other is referred to as occupationalism. The theory is often known as the I/O construct.

Moskos's concept of institutionalism is typified through behaviour that transcends individual self-interest in favour of a presumed higher good. This involves holding values such as duty, honour,

---

[1] Huntington (1957).

[2] Moskos (1977).

[3] Moskos later revised this theory to show that it is the members, rather than the collective military, who should be placed on the continuum - Moskos (1986).

and calling.[4] Institutionalism relies mainly on intrinsic motivators (pride, morale, esprit de corps, and non-cash remuneration to its members, i.e. welfare facilities, free medical care, etc.) It is similar to social collectivism in that the members put the good of the group ahead of themselves. Members who are institutionally orientated will happily perform extra duties even when no tangible reward is likely; they see their military service as a way of life rather than just a job.

Occupationalism, being the antithesis of institutionalism, relies on extrinsic motivators such as pay and other tangible rewards. Occupationalism, within the military, is perceived as a convergence of methods and policies with those of the civilian community. It is characterised through rigid work hours and detailed accounting procedures such as cost centres. Occupationally orientated members perceive their military service as a job and nothing more. Extra effort will only be made if it results in a pay increase or similar reward. 'The occupational model implies a priority of self interest rather than the interest of the employing body.'[5]

Military Values

Traditionally, the best militaries have been served by devoted and selfless soldiers. People who have been prepared to accept responsibility for their actions, while maintaining honesty and integrity. These characteristics epitomise the desirable values for any modern military. The easiest way to learn what values are espoused by an armed force is to look at its Code. However some militaries have not articulated their values in the written form. Only in the past year (1994-5) has the RNZAF documented what it considers to be appropriate military values. Technically, such lists do not reflect the values of the institution but merely the values agreed upon by collective members. They do however, give us the best possible starting point to conduct further analysis.

---

[4] Moskos (1986).

[5] Moskos (1986) page 379.

While the development of these lists, in the RNZAF, can be considered to be in its infancy, the fact that they reflect more long standing codes from overseas means that they are fairly comprehensive. The following list is derived from the General Service Training Squadron (GSTS): loyalty, honesty, discipline, courage, professionalism, pride, tolerance, and confidence. The RNZAF's Strategic Plan[6] lists many of the same but also includes diligence. Other popular military values include: altruism, patriotism, and commitment.[7]

These lists provide an introduction to what are considered the 'traditional military values' but it is possible to refine them even further. The values listed so far can be divided into two important and distinct categories: institutional and character. The two types differ in several ways: their observation, their inculcation, and their influence.

Institutional values are the values that reflect a member's sense of belonging to a given group or organisation. They will apply to that specific group but need not be consistent with their connections to other groups. For example, people's concept of honour within the church may be different to their concept of family honour. Typical institutional values include loyalty, honour, self-sacrifice, and sense of duty.

Although character values are also held by individuals, they are generally more consistent. People maintain their character values at all times, wherever they are, whatever they are doing. The importance they place on honesty will be fairly permanent, depending on where they are on the Affective Taxonomy,[8] even though their attitudes may be influenced by more than one value. Typical character values include honesty, integrity, tolerance, courage, and pride.

While the military desires both types, the process of inculcating them differs. The institutional values are more macro level and are promoted to the group. The character values are just as important, but differ between individuals. This means that their development will be more on the

6 The RNZAF Strategic Plan -RNZAF News edition of the NZAP 701 (1994), page 3 and NZAP 701 (1995) p9.
7 Gabriel (1980) Maginnis (1993) and Maruna (1994).
8 Kathwohl, Bloom, and Masia (1964).

micro level. Character values are inculcated by socialisation with a group, but their formal teaching is more on a one-to-one basis.

Both types of values are brought into the military by new recruits but the character values are likely to be far more developed. Many of the institutional values will be new to the recruit and this is where the military has its greatest influence.

Unlike institutional values, there is little concern about the characterization[9] of character values in service personnel. Because they do not require a specific social situation and are consistent in different environments, they are much easier to identify. The military screen potential recruits for certain character values - this has the effect of self-selection in terms of 'traditional military values.' Even after the recruiting process, breeches of character values are easily observed and corrected.

Institutional values, being sociological phenomena, are more subtle and not so easy to pinpoint. This invisibility also makes it hard to observe their changing directions. While those who have extensive military experience notice something is missing in the newer generations, they are often unable to identify exactly what it is that has changed. Despite its faults, Moskos' I/O construct has been heralded as the looking glass into this abstract world.

Janowitz criticised Moskos' I/O theory by arguing that the concept of professionalism in the military will continue regardless of its occupational or institutional orientations.[10] He also introduced the concept of discontentment as a factor in the military's loss of institutionalism. The I/O construct could very easily be simply measuring the degree of esprit de corps felt by the members of a given armed force. Although this is part of what Moskos hoped to measure it is certainly not the whole picture. According to Janowitz, a high score on the occupational scale may simply indicate a dissatisfaction with the military. Conversely, higher morale and perceived acceptance by society may yield a higher institutional score.

---

9 Characterization is used in terms of Kathwhol's Affective Taxonomy. Kathwhol et al. (1964)

10 Janowitz (1977), page 52.

David Segal challenged Moskos's theory on the grounds that it was not a true continuum. Segal found the two extremes were not zero sum.[11] That is, someone could score either high or low on both. In fact, they could score any number of four combinations (including high-low and low-high variations). Segal's claim was later supported by McCloy and Clover.[12]

This inconsistency with the I/O model has been identified as the Unilateral Continuum Problem. Although individuals can score high on both institutionalism and occupationalism, the real question lies with their characterisation of values.[13] McCloy and Clover claim that both aspects not only coexist, but both should be promoted.[14] While occupationalism would appear to be in conflict with traditional military methods, it is also necessary for growth. The military needs some people to be able to excel on an individual basis. Intragroup competition is essential for identifying those worthy of promotion. Obviously this needs to be tempered with collectivist values such as discipline and loyalty.

Structural Pluralism is one of the terms used to describe the complex nature of this continuum that is not a continuum. Segal, Blair, Lengermann, and Thompson[15] suggest that covariance is not only possible but could in fact be an indicator of stability. They found that career officers displayed both orientations while non-career officers displayed only institutional orientations. This unusual effect was also found in the first ever attempt at operationalising Moskos's 1977 theory by Stahl, Manley, and McNichols.[16] Stahl et al. discovered institutionalism and occupationalism to be negatively related amongst high ranking and more integrated groups ie Senior Non-Commissioned Officers (SNCOs) and Officers. It would appear that in some situations Moskos's original theory applies, whereas in others, it remains incomplete.

---

11 Segal (1986a) page 355.
12 McCloy and Clover (1989) page 130.
13 See Kathwohl's Taxonomy in Kathwohl et al. (1964).
14 McCloy and Clover (1989) page 130.
15 Segal, Blair, Lengermann, and Thompson, (1983) page 113.
16 Stahl, Manley, and McNichols (1978) page 425.

In 1986, Segal again attempted to apply the Moskos I/O construct. In this study he maintained that institutionalism and occupationalism are two autonomous dimensions whose trends are in the same direction. He went on to develop a concept of *Pragmatic Professionalism* which is a mixture of institutional and occupational concerns.[17] Another aspect of Moskos's original theory that has received considerable debate is the semantic definitions. Cotton, for example, moved away from the term 'institutionalism', replacing it with 'vocation.' His contention, like Janowitz,[18] is that the military will remain an institution 'regardless of whether its features shift in terms of the occupation model described by society.'[19] Cotton maintains that the term 'vocation,' in terms of the military, is a more accurate definition of what Moskos calls institution.

Cotton's development of the I/O construct also identified two key aspects of institutionalism (vocation) which are easily measured: primacy and scope. Cotton articulated these two concepts into questions on a Likert scale questionnaire. He refers to his instrument as the Military Ethos Scale (MES). Primacy refers to the priority with which a person places the military relative to their other commitments. Generally, the biggest competition the military faces, in terms of primacy, is the family.[20] A person scoring high on Cotton's MES primacy questions would place the military above all other commitments. Similar to the measure of primacy is the issue of scope. Scope refers to a person's degree of commitment toward the military outside of normal work hours. A person scoring high on Cotton's MES scope questions would see their military career as a way of life and is with them 24 hours a day.

Primacy and scope are both heavy institutional demands which the military places on its serving men and women. The military's degree of influence in each aspect however, appears to differ between the genders. Although not much research has been conducted in the field of gender differences, some authors have briefly discussed the subject.

---

17 Segal (1986a) page 358.
18 Janowitz (1977) page 52.
19 Cotton (1981) page 102.
20 Segal (1986b) pages 81 and 82.

Moskos, for example, claims that the ratio of females to males in Western militaries is usually around 1 : 9 and their roles are usually limited to support duties.[21] In such few numbers and in the types of duties they perform, their level of institutionalism is understandably of less concern to senior officers. The need for strong military values is greatest in combat units when on operational tours. However, in the last few years most militaries have broken down the formal barriers to women in combat roles. With women now entering into this previously male dominated domain, there is a need to identify any possible gender differences.

Most of what has been written on the subject has argued that gender differences do exist, but only as a result of out dated regulations and sexist social pressure.[22] Karen Dunivin for example, argues that the traditional military culture is characterised by a combat, masculine-warrior paradigm. She goes on to argue that it is impossible to legitimise a female culture within the military which is, by her definition, synonymous with male culture.[23] While Dunivin acknowledges a gender difference in the military, she blames it on the sexist attitudes and regulations that are still being imposed.[24]

Moskos and Wood found clear gender differences between married and unmarried service personnel. For example, in the US armed forces 89% of male senior non commissioned officers were married as opposed to their female cohort of whom 26% were married.[25] This suggests that when servicewomen get married, they leave the military - as opposed to males who tend to stay on.

Based on the claims of Dunivin and the findings of Moskos and Wood, a gender difference could be anticipated, in that males should score higher on the MES than females. But as with all the speculations on military values, there is a need for actual data to support the claims.

---

21 Moskos and Wood (1989) page 285.
22 Segal et al (1979) page 123.
23 Dunivin (1994) page 534.
24 Dunivin (1994) page 533.
25 This analysis was based on 1985 data. Moskos and Wood (1989) page 285.

2.2 Assessing Military Values

Since the publication of Moskos's I/O construct in 1977, numerous studies have attempted to measure military values. While the theory has shortcomings, it has promoted dialogue and interest in the field.

Collyer[26] has used the I/O construct to measure the attitudes and values of Australian Army personnel. His study included a cross-cultural comparison of soldiers and Non Commissioned Officers (NCOs) using both the Stahl et al.[27] and Cotton[28] measures. Collyer found that Cotton's primacy and scope measures were not uni-dimensional (unlike Cotton) but developed them into separate scales as measures of role commitment. Collyer also found difficulties with the Stahl et al. measure. In particular, he was uncertain about the difference between job satisfaction and calculative commitment[29] with regards to Moskos's occupationalism. Collyer did not find support for the claim that combat units will score higher on institutionalism and support units will score higher on occupationalism. What he did discover was that the roles with civilian equivalents were more occupational, and those which had no civilian equivalent were more institutional. Overall, Collyer concluded that Moskos' I/O theory was valid within the Australian Army.

Within New Zealand, only minimal attention has been given to Moskos's theory. One of the earliest mentions of the construct was in a 1991 New Zealand Defence Force (NZDF) Research Report.[30] In his descriptive analysis comparing the NZDF with other New Zealand organisations, Bruhns introduced the concept of institutionalism and explained why it is so important to the military. Bruhns did not however, provide any empirical data to support or test the construct within New Zealand.

---

26 Collyer (1995).
27 Stahl et al (1978) page 423.
28 Cotton (1981) page 102.
29 See Collyer (1995) for a more detailed explanation of calculative commitment.
30 Bruhns (1991) page 42.

Another more recent report written about Human Resources within NZDF by Beale,[31] acknowledged the writings of Moskos yet argued in contrast to Bruhns. Beale is a well-known advocate of increased civilianisation in the military - both in actual posts and also in management and financial policies. His thesis argues for a more streamlined, and financially efficient, New Zealand Military but like Bruhns' paper, it lacks empirical data. He does provide however, some valid arguments. In particular, he identifies the unilateral continuum problem of the I/O construct and the difficulty in applying it to the NZDF. As has been discussed in other studies,[32] Beale reiterates that occupationalism is in fact a healthy and necessary component of military culture. Unlike institutionalism however, occupationalism is easily identified and promoted. Furthermore, todays society appears to be promoting occupationalist values more than institutional ones.

One recent NZ report that used Moskos's theory and did contain empirical data was the doctoral dissertation of Fiona Alpas[33]. Alpas' research focussed on the NZ Army yet although loosely based on the I/O construct it did not specifically measure institutionalism or occupationalism.

From the RNZAF's perspective, it was Kevin McKenna who drew the greatest attention to Moskos. In his Command and Staff College dissertation, McKenna introduced both the I/O construct as well as the concept of declining military values within the RNZAF.[34]

Moskos had also argued that the US military was witnessing a decline in what he referred to as 'traditional military values.'[35] Many others, from all around the world, were quick to agree with him and even today, feel that the military is losing its essential spirituality. While these gut feelings are numerous, they remain largely unsubstantiated by hard data.[36]

---

31 Beale (1995) pages 3 and 4.
32 McCloy and Clover (1989) page 130 and Segal (1984) page 363.
33 Alpas (1994).
34 McKenna (1993).
35 Moskos (1977) page 42.
36 Sørensen (1994) page 605 and Segal (1986a) page 351.

To properly assess any shift in values, longitudinal studies need to be conducted. Such studies are unfortunately, very rare. The obvious problem is that no I/O data exists prior to 1977. Compounded with this however, is the fact that most of the subsequent research has been orientated at measuring current values rather than changes in values.

Those who have attempted to measure changing values have found conflicting results. Among the first to operationalise Moskos's theory were Stahl, McNichols, and Manley. In 1977 they administered an eight item questionnaire to 10,000 United States Air Force personnel and then followed it up three years later.[37] During that three year period Stahl and his colleagues found an increase in occupationalism across the entire sample and within all but one subgroup. The only group not to increase was a small number of personnel who had served for 26 or more years.

Segal has also attempted to measure the so-called decline. Unlike Stahl et al., Segal was not convinced that sufficient data existed to validate the claim of decreasing institutionalism. Segal based his claim on the results of more than ten separate studies. These studies included both survey (direct and indirect inquiry) and ethnographic research techniques.[38]

Attempts to measure military values, and the effectiveness in teaching them, has also had its difficulties. Even with the I/O construct available, many military institutes are unsure exactly what 'military values' are and to what degree their students should hold them.

In 1992, a program evaluation study of the Australian Defence Force Academy (ADFA) had difficulty in measuring the effectiveness of the Military Studies Department because it did not have any formal objectives. Although unable to measure effectiveness, the ADFA Review Team acknowledged that military education and training was paramount to the ADFA concept and that 'it involves the acquisition of basic military knowledge, specific skills, personal attributes and

---

[37] Stahl, McNichols, and Manley (1980).

[38] Segal (1986a).

motivation.'[39] The evaluation found that although the Academy was required to 'maintain a military environment' there was no Defence definition of what that 'military environment' was.

Other studies that have attempted to measure value changes in military training establishments have also run into problems. A recent study conducted at the United States Coast Guard Academy focussed on the change in cadet values during the four years of enrolment.[40] Stevens, Rose and Gardner employed two tests - the Survey of Personal Values and the Survey of Interpersonal Values - to 100 cadets. Their results indicated definite changes in certain values but they were unsure what it was that caused them to change. Citing other research conducted in the US, Stevens et al. concluded that 'normal' college experience outside the military would also result in value changes.[41] They went on to acknowledge that value change results from an interactive process between both environment and maturation.

Attempts to correlate conscious institutional efforts with changing student values has proven difficult in other studies. One investigation, conducted on US dental students, found that students' values changed over a four year period but in a direction which was inconsistent with the values promoted by the institute.[42]

Priest, Fullerton and Bridges[43] reported three longitudinal studies conducted between 1971 and 1979 at the United States Military Academy (West Point) in which they used questionnaires to measure the effect of four years at West Point on the attitudes, values and personalities of students. The students were questioned about their commitment to nine different reference groups, ranging from self, family, ethnic group up to the world community. Their findings suggested small changes, if any, in every category tested except 'self'. Where a change was noted, it was a decrease. While Priest et al. did not specifically investigate the I/O construct (their study predated

[39] Department of Defence (1992) page 5-1.
[40] Stevens, Rose and Gardner (1994).
[41] A longitudinal study involving 200,000 college students by Astin (1977).
[42] Soble (1977).
[43] Priest, Fullerton and Bridges (1982).

the model), a measure of institutionalism may be inferred from their assessment of loyalty and commitment. The results suggested a decline in these values.[44]

While the decrease in loyalty surprised Priest and his colleagues, they concluded that students developed a selective rather than generalised loyalty ethos as they matured. To consider the change in student's occupationist ethos, it is possible to look at the emphasis the cadets placed on individual academic achievement. Overall, the study found that students at West Point reduced their emphasis in commitment, loyalty and individual achievement. It would appear that their only major finding was that as the students matured, they became more conservative. Priest et al. also concluded that the change of values of West Point Cadets reflected the change of values evident in other student groups elsewhere in the US.

In contrast to the studies already discussed, one study claims to have found positive trends in the institutional values of students. McCloy and Clover[45] conducted a study at the United States Air Force Academy (USAFA) where they administered questionnaires to over 2000 students ranging from freshmen through to seniors. While their results do not indicate an increase in such values, they do appear to remain consistently high. McCloy and Clover were enthusiastic about the effect the Academy was having on promoting and maintaining institutionalism. One outcome that they did appear surprised about was the fact that students could score high on both institutionalism as well as occupationalism. The unilateral problem of Moskos's model has since been endorsed and is now well established.

McCloy and Clover detail the reasons why they feel the USAFA was so successful in maintaining high scores in institutionalism[46] and also justify why they feel that scoring high in occupationalism measures is a good thing.

One aspect which fails to receive sufficient attention is that of self-selection. While McCloy and

---

[44] Priest et al. (1982).

[45] McCloy and Clover (1989).

[46] These include the Academy's three mission elements: military, academic, and athletic. See pages 135-140.

Clover do discuss the role of recruiting, they claim that advertising literature appeals to both elements of the I/O model. They do not pursue the possibility that self-selection was the predominant reason for high institutional values - or occupationalism, for that matter. Some studies however, have investigated this possibility. One of the most recent has been that of Bachman, Sigelman and Diamond.[47]

Bachman and his colleagues investigated the notion that military institutes merely recruit personnel who already hold certain values rather than actually teaching them. Bachman et al. acknowledge that self-selection and socialisation are not mutually exclusive and that varying degrees of both will coexist. Their aim however, was to establish the influence of self-selection. Using a sample of around 170,000 high school seniors over a ten year period (1976-86), they administered questionnaires to measure both career intentions and attitudes. Their analysis involved comparing the attitudes of those who intended to enlist with those who did not. They went on to compare the attitudes of these two groups with those already serving. The major finding of this study was that no pro-military attitude differences existed between those planning to enlist and those already serving. Significant differences were however, found between those intending to enlist and those who did not.

Another similar study was conducted by Cockerham,[48] who looked at the self-selection and career orientations of paratroopers in the US Army. Like Bachman et al., Cockerham concluded that the predominant influence of pro-military attitudes in serving personnel were the attitudes and beliefs that they brought with them when they enlisted.

Although neither of these two studies measured the institutional values of the I/O model specifically, they did raise an interesting question about how much influence the military actually has in teaching its traditional values.

---

47 Bachman, Sigelman, and Diamond (1987).
48 Cockerham (1978).

2.3 Separating Inefficiencies From Corporate Factors

Previously, the cost of the military factor has been either the majority, or a small fraction, of the cost difference between civil and military run courses. These two perspectives reflect the different approaches taken by the RNZAF[49] and the Ministry of Defence.[50] This thesis however, advocates dividing the cost difference three ways: the military factor, inefficiencies, and corporate factors. By subtracting the inefficiencies and corporate factors from the total cost difference, a dollar value can, in theory, be derived for the military factor.

This process requires a clear identification of all three elements. While the military factor is examined in part one of the thesis, part two attempts to separate the corporate factors from any inefficiencies.

Inefficiencies and Corporate Factors

If two independent training institutes provide a similar course for a different cost then there must be differences in their methods. The cost difference, and associated method differences, may indicate a different quality of graduate or it may indicate greater inefficiencies. Separating inefficiencies from factors that improve the quality of training is a difficult task. Because of the subjectivity in educational psychology, some elements are difficult to isolate for cost benefit analyses. The situation is further complicated by the fact that different institutions perceive different aspects as being more important than others. This thesis does not attempt to offer a relative measure for the numerous variables in training; instead it presents a tool that can be used to evaluate the cost effectiveness of such variables under different configurations. For example, the cost variation of a course under various different class sizes.

---

49 Barnes (1994) argued that the majority of the cost difference should be attributed to the military factor.

50 Ministry Of Defence (1994) Audit and Assessment Report Number 83 acknowledged the existence of a military component in RNZAF training but argued that the majority of the cost difference between civil and military training indicates huge inefficiencies in the RNZAF's training system.

Identifying Corporate Factors

Effective instruction is made up from a number of elements. Most of these elements are conscious components that have been deliberately implemented into a training system. Some of these include: Staff-student ratios, class sizes, course duration, class contact time per day, pre-course selection procedures, teaching methods, learning environments, training aids, student resources, syllabus development, quality of instructors and quality of support systems.

While all of these factors have an influence, some will be greater than others and all will have an optimum level of cost effectiveness. Identifying their degree of influence and cost effectiveness is, in most cases, difficult if not impossible. The RNZAF has been challenged on the cost effectiveness of some of its training philosophies, in particular, its class sizes and staff student ratios.[51] While it is true that these are quite different to those in the civilian sector, the RNZAF has made a conscious decision to set them at the levels they are. In fact, many of the corporate factors listed above, have been identified and discussed in an RNZAF policy document written during the 1980s by Peter Mason.

In developing a tool for analysing corporate factors, the Mason report provides an appropriate base. Not all of his arguments remain valid in the 1990s however and some aspects of the report could be due for updating.

The Mason Report

The RNZAF's formal policy for determining instructor establishment numbers is contained in a document known as the Mason Report.[52] The report contains a model, derived from the RAF,[53] that calculates the required number of instructors based on the number and type of courses offered by any given training school. The following pages identify the key aspects and faults of Mason's model. A more detailed explanation is provided in Appendix B.

---

[51] MOD Audit And Assessment Report Number 83 (1994).

[52] Mason (1986).

[53] RAF SC/351005/2/Est Position Paper on Instructor Establishments.

The concept of the model is quite simple in that it multiplies the number of instructional hours per course by the total number of courses per year. The 'instructional hours' are determined from a series of factors which allow for preparation as well as class contact time. An allowance is also made for the instructional time lost due to additional duties outside the commitments of the training school. This allowance, called the Instructional Diversion Factor (IDF), includes activities such as: parades, unit administration, leave, sports tournaments, staff development, community work, etc.

While the model provides a useful guideline for establishment calculations, it is not without its critics. Being a theoretical model it does have flaws when being applied in practice. Individual units are seldom without their exceptions to the rules. Smaller trades[54] for example, often use instructors on a part time basis when courses are not run continuously. In larger trades however, instructors will often assist with multiple courses simultaneously. The ability of a training unit to dovetail[55] courses assists with their ability to optimise instructor utilisation and minimise inefficiencies. The Mason model does not account for continuous or dovetailing of courses.

A further problem with the original Mason model was that it required detailed manual calculations that extended over several pages. The model employed complex and difficult language that was further complicated by extensive use of abbreviations. Although the military does make extensive use of abbreviations in its normal operations, these are usually limited to frequently used and understood terms. For most users of the Mason model the terms he used were not in common use.

Mason offered numerous categories for lesson types. Many of these are difficult to apply out when dividing up a course. For example, Mason offered a separate preparation to teaching ratio for: showing videos, team teaching, team learning, discussions, lectures, programmed instruction, etc. In reality, most instructors would use a variety of each type within a given period of instruction. It is difficult to determine how a course should be divided into each of these categories.

---

54 Smaller trades include Librarians, Police, Fire, Typists etc. In these trades the RNZAF will only recruit 4 or 5 people a year which means that class sizes have to be small and only one course is held each year.

55 Dovetailing refers to the careful planning of courses to ensure that instructors, and other resources, required to teach only certain sections of a course can do so, simultaneously, for multiple courses without clashes or unproductive time.

The model presented by Mason advocated recalculating the Instructor Diversion Factor (IDF) every time it was employed. Most of the figures required for this calculation are not readily available. For example most training managers would not know exactly how much time was lost to the unusual leave types (bereavement, jury service, etc) nor how much time was actually being taken by instructors for daily fitness. Although the RNZAF's policies indicate what servicemen and women are entitled to take, there is little known about what people actually do as different units operate in different ways. Some instructors may take more time for sport when there are no courses on but then take no sport for the rest of the time. It is unlikely that the Mason model's calculation of the Instructor Diversion Factor should be on maximum entitlements as these would be in excess of reality.

In the absence of actual data, users of the Mason model have been inclined to use Mason's figures as a benchmark. This approach initially appears quite sound although a problem that has developed is that in the past ten years many things have changed in the RNZAF's training system. The culture of the RNZAF has altered due to its change in scale of leave, its policy on taking sport, and because the duties of an instructor have evolved.[56] A new updated benchmark is required.

[56] In 1986 RNZAF ground training was conducted at six separate training schools. Now, the RNZAF has pooled its resources by brining all the schools together and sharing most of the support tasks. Computerised assessment and time tabling has also made a big difference to the workload of a typical RNZAF instructor.

Thesis Structure

This thesis seeks to explore three aspects of military values: Self-Selection, Inculcation, as well as developing a model for Separating Inefficiencies from Corporate Factors.

Self-Selection

Based largely on the work of Bachman et al.[57] this section investigates the extent that the RNZAF recruits its military values. Separating the study into two groups (Officers and Other Ranks), the study compares the attitudes of newly enlisted personnel with those already serving. If the RNZAF does self-select its culture then the personnel who chose to enlist, or who are allowed to enlist, are likely to share the same attitudes as those who are already serving. If the pro-military attitudes of new recruits are significantly lower than those of serving personnel then it would be accepted that the military factor does exist.

Inculcation

Military courses are thought to differ from civilian courses in that they inculcate the military culture into students. Some aspects of the military culture can be labelled corporate factors and could be taught by either civilian or military training institutes. The inculcation of military attitudes and values however, needs to be conducted within a military environment. This aspect, known as the true military factor, is claimed by the RNZAF to exist in all military courses.[58] The MOD Audit Report agrees that such an aspect is relevant in initial recruit and officer courses but questions its need or existence in trade courses.[59] This part of the thesis measures the extent of the military factor in RNZAF courses by assessing pre- and post-course attitudes.

---

[57] Bachman, Sigelman and Diamond (1987).

[58] Barnes (1994).

[59] Ministry of Defence Audit and Assessment Report Number 83 (1994). Page 39,paragraph 102.

Separating Inefficiencies From Corporate Factors.

The final part of this thesis develops a tool for examining the different aspects of training with the goal of optimising their effectiveness and minimising any inefficiencies. To do this the model had to first establish what the RNZAF's policies were on desirable and essential elements of military training. The thesis found most of these policies detailed in the 1986 Mason Report.

The thesis examined the original Mason model with the intention of improving its availability and usefulness. The first part of the upgrade involves collecting recent data on the actual time lost from instructional duties. This data is then available for compiling a 1995 sample calculation of the Instructor Diversion Factor from which other studies will be able to compare. The second and more major change made to the Mason model is the conversion of it into an electronic spreadsheet. In the process, the model is simplified down so that the computer performs much of the complex details about rounding and summarising of categories automatically. By doing this, the model becomes a tool far quicker to learn and use. This in turn means that it can be used by a greater number of people.

Having upgraded the Mason model, the thesis is then able to develop it even further. This new model, the Corporate Factor Analyser, includes the other aspects of training not already addressed in the Mason model. By including all of these corporate factors into a single equation, it provides the opportunity to manipulate them so as to find their optimal level of value for money.

Chapter 3
Method

The method section is divided into the three separate studies of the thesis: Self-Selection, Inculcation and Separating Corporate Factors from Inefficiencies.

3.1 Self-Selection

This study investigates the possibility that the RNZAF self selects its culture by comparing newly enlisted personnel with a control group of serving personnel.

Participants

Experimental Groups

Two experimental groups were formed, the first consisting of every available recruit, and the second, every officer cadet who enlisted during the period of the study. Questionnaires were administered to both groups within one week of enlistment. The 1/95 IOTC were newly enlisted officer cadets on their officer training course. Table 1 shows the composition of both groups.

Table 1 **Experimental Groups' Distribution by Intake and Gender**

	Experimental Group One (Recruits)	Male	Female	Total
R2/95	Initial Basic Military Training (IBMT) Recruit Course	35	16	51
R3/95	Initial Basic Military Training (IBMT) Recruit Course	53	18	71
R4/95	Initial Basic Military Training (IBMT) Recruit Course	42	11	53
R1/96	Initial Basic Military Training (IBMT) Recruit Course	70	24	94
	Total	**200**	**69**	**269**

	Experimental Group Two (Officer Cadets)	Male	Female	Total
1/95	Initial Officer Training Course (IOTC)	17	4	21
R3/95	Initial Basic Military Training (IBMT) Recruit Course	12	3	15
R1/96	Initial Basic Military Training (IBMT) Recruit Course	20	5	25
	Total	**49**	**12**	**61**

Control Groups

Two control groups were formed by taking a cross-section of the RNZAF. Group One consisted of enlisted personnel and Group 2 were officers. Attempts were made to represent the RNZAF by base, gender, trade and length of service. Table Two shows the distribution of personnel from each of the available RNZAF Bases. While some bases appear to be under represented, some compensation can be made through the unspecified group. Questionnaires were distributed on a proportional basis to the population serving at the respective locations.

Table 2 Control Groups Distribution by Base[1]

RNZAF Bases *(as at 2 August 1995)*	Control Groups				RNZAF Population *as at 2 August 1995*	
	One	Two	Combined			
	n	*n*	*n*	% of sample	*n*	% of RNZAF
RNZAF Base Auckland	31	9	40	*21.6 %*	1320	*38.6 %*
RNZAF Base Ohakea	13	3	16	*8.6 %*	742	*21.7 %*
RNZAF Base Woodbourne	34	10	44	*23.8 %*	872	*25.5 %*
RNZAF Base Wigram	29	1	30	*16.2 %*	200	*5.9 %*
Air Staff - Wellington	13	10	23	*12.4 %*	177	*5.2 %*
Other/Overseas	4	0	4	*2.2 %*	105	*3.1 %*
Unspecified	28	0	28	*15.1 %*		
Total	**152**	**33**	**185**		**3416**	

Combined Control Group represents 5.42 % of RNZAF total

Break downs of the control groups by gender and length of service are shown in Chapter Four.

Due to low numbers of females in the experimental groups, gender analyses were limited to the recruit-enlisted personnel study.

[1] Statistics of serving personnel were obtained from official RNZAF records on 2 August 1995.

Instrument

Moskos has not developed a specific tool for measuring his I/O construct but with Wood[2] has provided a collection of different instruments which have been developed by other authors. Most of these are in the form of Likert questionnaires and have been developed for measuring the institutional and occupational values of serving personnel.

Because this study involved personnel with little or no previous military experience, the instrument chosen needed to be free of military specific language. From the selection offered by Moskos, the Military Ethos Scale (MES) questionnaire developed by Cotton for the 1978-9 Canadian study was chosen.[3]

The Military Ethos Scale Questions are as follows:

1. *No one should be compelled to take a posting he or she does not want.*
2. *What a member of the forces does in his or her off duty hours is none of the military's business.*
3. *Military personnel should perform their operational duties regardless of the personal and family consequences.*
4. *Differences in rank should not be important after working hours.*
5. *What a member does in his or her private life should be no concern of their supervisor or commander.*[4]
6. *Personal interests and wishes must take second place to operational requirements for military personnel.*

Questions 1, 3, and 6 deal with the primacy issue whereas 2, 4, and 5 probe the respondents' concepts of scope. Overall, the original wording of the questions was considered appropriate for accurate interpretation by the two experimental groups. All questions were followed by a five point Likert scale, ranging from "strongly agree" to "strongly disagree."

---

[2] Moskos and Wood (1989).

[3] Cotton (1981).

[4] Question five was amended to read "his or her" rather than just "his."

Personal data were requested to allow age, trade, rank and gender comparisons to be made. In the case of the control group questionnaire, respondents were also asked to indicate their length of service and the Base on which they were currently serving. A copy of the questionnaire appears in Appendix C.

Procedure

To assess differences in attitudes, the combined scores[5] for the two experimental groups were compared with the sample means of the respective control groups. Within each part of the study (officers and other ranks) separate analyses were performed for a sub-control group as well as the collective group. The sub-control groups consisted of personnel who had served for less than ten years. Jans[6] found that those serving more than ten years were less representative of the entire military population, as personnel with neutral or negative attitudes toward the military were likely to have resigned by this time.

Data Analysis

Using Cotton's method of scoring, responses were recorded from 1 (strongly agree) to 5 (strongly disagree) with questions three and six being reverse scored. This provided a score range from six to 30. The data were manually scored and entered into a ClarisWorks 2.1Bv3 database. Further statistical analyses were performed using StatView SE+Graphics™, v1.03 (Macintosh Version). One tailed, one group, t-Tests were employed to test the significance of the differences between the experimental groups and the respective RNZAF control groups.

---

5 'Combined' refers to male and female scores combined as well as primacy and scope scores combined.

6 Jans (1989) based his findings on the Australian Defence Force. Other authors have found similar findings *see* Segal (1986a).

3.2 Inculcation

This part of the study investigates the possibility that the RNZAF inculcates its culture during formal training courses.

Participants

Table 3 shows the cross section of general service, promotion and trade courses that were used for the experimental groups in this part of the study. While some courses have already been used in the self-selection study the sample sizes differ because of the availability of suitable data. For this investigation, data were only used where both pre- and post-course scores were available. Due to the low number of females in the sample, gender analyses were only performed for the two recruit courses.

Table 3 **Inculcation Study Experimental Groups**

		Male	Female	Total
	General Service Courses			
R2/95	Initial Basic Military Training (IBMT) Recruit Course	35	16	**51**
R3/95	Initial Basic Military Training (IBMT) Recruit Course	46	15	**61**
1/95	Initial Officer Training Course (IOTC)	12	3	**15**
	Promotion Courses			
2/95	Basic Engineering Course (BE)	25	1	**26**
2/95	Flight Sergeants Qualifying Course (FQC)	10	2	**12**
	Trade Courses			
2/95	Aircrew Instructional Techniques Course (AITC)	10	2	**12**
1/95	Junior Officers Executive Course (JOEC)	5	1	**6**
	Total	**143**	**40**	**183**

An explanation of each course, their nature and typical student composition, is provided with the discussion section in Chapter Four.

Instrument

This study employed the same questionnaire used in the self-selection investigation. Cotton's MES was deemed suitable because it was quick to administer and easily understood by all personnel. Its simplicity ensured a higher return rate and made it suitable for administering to new recruits.

Procedure

To assess the extent of the military factor, Cotton's MES questionnaire was administered to students in their first and final weeks of the course. These two exposures of the questionnaire produced the pre- and post-course scores for each course. Students used a four digit personal identification number to code their two questionnaires.

Not all students were available for both the pre- and post-course administrations of the questionnaire. Incomplete data, in terms of pre- and post- pairing, were excluded from the study. Partially completed questionnaires were also excluded from the analysis. A total of 208 personnel completed questionnaires for this part of the study but only 183 completed both. This represented an 87.98% return rate of useful data.

Data Analysis

As with the self-selection study, the scoring method was consistent with Cotton's original design. A paired t-Test was employed to measure the difference between the pre- and post-course scores. The residual difference between the scores was then interpreted as the level of military factor for each course.

3.3 Separating Inefficiencies From Corporate Factors

The first two parts of this thesis are attempting to identify the component of RNZAF training that can be classified as the true military factor. As already stated, this thesis argues that the difference between military and civilian training providers should in fact be divided three ways: the military factor, inefficiencies, and a third component known as the corporate factor. The difference between a corporate factor and an inefficiency is often in the eye of the beholder. To be able to justify retaining certain training philosophies it is necessary to fully understand their cost and influence. Unfortunately the influence, or effectiveness, of many training philosophies requires a subjective evaluation, the measure of their cost can at least be more scientific. This final part of the thesis proposes a model, the Corporate Factor Analyser (CFA), for optimising corporate factors and minimising inefficiencies. This model allows a user to project the cost of a course under various different conditions. These conditions refer to the manipulation of one or more corporate factors.

Overview of the Corporate Factor Analyser

The CFA model was developed on a standard computer based spreadsheet.[7] Once the current operating costs and conditions of a given course have been entered, an individual corporate factor can be selected for manipulation. The spreadsheet is pre programmed with maximum and minimum values for each of the main corporate factors and automatically calculates the projected cost of the course under varying increments of that manipulated variable. The results are then presented in graphical form. New maximum and minimum values can be specified to overwrite the preset ones and additional corporate factors can easily be added for additional manipulation.

The instrument for analysing corporate factors is based on the Mason Model, which was originally developed for determining staffing levels in RNZAF training schools.[8] Staffing levels impact directly on the instructor student ratio, which is one of the many corporate factors in the realm of effective instruction. The new model is further enhanced with the addition of other corporate factor

[7] The programme used for this version was Macintosh ClarisWorks ™ 2.1Bv3.

[8] Mason (1986) see also the detailed explanation in Appendix B.

variables. Examples of these include instructor salaries, staff development budgets and consumables per course.

As was discussed earlier, the Mason Model is now outdated and inaccurate.[9] Before developing the Corporate Factor Analyser (CFA), it is necessary to produce a new and more usable model for establishing staffing levels. This chapter will outline the proposed solution to this problem by detailing an updated version of the Mason model.

The Updated Mason Model

Based largely on Mason's manual spreadsheet model, this proposed new system incorporates simplified categories and methods along with the added advantage of computerised calculations. Making the system electronic not only saves time and increases accuracy but also reduces the need for in depth understanding by users. It is not necessary for all users to understand how the calculations are made, nor philosophies behind them. Developers, and more critical analysts however, still have the opportunity to challenge the model and update it when required.

To determine the number of instructors required, the model multiplies the number of periods in a course by the platform factor for that lesson type. The platform factor makes an allowance for preparation and development as well as delivery time for each lesson. Adjustments are also made by the model for the size of the course and the number of smaller class groups that will be used.[10] The instructor hours per course are then multiplied out by the number of courses per year. Where courses are taught on an irregular basis, their number is averaged out for an annual figure. For example, a course that is taught three times in two years will have a figure of 1.5 entered into the 'courses per year' cell.

---

[9] In addition to the overview in Chapter Two, a detailed explanation of the model appears in Appendix B.

[10] The spreadsheet is able to determine how many classes a course needs to be broken into. By specifying the number of lessons needed to be taught to different class sizes and by entering the course sizes, the computer can divide up the course and compute the number of instructors required. This new development for the model has the added advantage of adjusting the maximum class size as a corporate factor when the model is included in to the CFA.

Mason makes the assumption that one period is equal to one hour.[11] He bases his logic on the fact that the lessons are around 50 - 55 minutes long and the remaining five minutes accounts for relocation between classes. Unless specified otherwise, 'periods' and 'hours' are synonymous units of measure throughout this report.

A diversion allowance (the IDF) is used to determine the number of instructors required to conduct that course. Put simply, the IDF subtracts off the non teaching activities from the total number of teaching hours in a year. This new figure of the available instructing time is then used to determine the number of instructors required. The data used to derive the diversion factor are the subject of a major review and will be discussed in more depth later in this chapter.

Having calculated the number of instructors required, further calculations are then made for supervisors and support staff. This whole process is repeated for all courses offered by that training provider in any given year. The figures for all the courses are then added together to determine how many instructors, supervisors and support staff are required for that training unit.

To use the model, an analyst simply opens the programme and enters the necessary figures into the the cells marked with boarders. These figures can be derived directly from the respective manuals of training (for period allocation and name of course) and unit course schedules (for number of courses per year and average course sizes). The courses per year are entered in the PLOC boxes. PLOC (*or* Present Level Of Capability) refers to the average number currently being planned for. Additional information can also be added for more advanced applications. For example, the model can easily be employed to calculate instructor numbers for operational requirements (OLOC).[12]

The RNZAF is required to plan for various contingencies much like an insurance company manages its different risks. To do this, the RNZAF needs to determine staffing levels, and graduate output, from its training providers in order to support the operational elements of the New Zealand Defence Force and its allies. By entering differing OLOC requirements, this model will be

[11] Mason (1986) page D3 *see also* Appendix B.

[12] Operational Level Of Capability (pronounced 'O Lock') refers to when the RNZAF is operating at a state of war.

able to tell the a manager how many instructors will be required for that state. To determine this figure, the model simply recalculates the PLOC figures using the OLOC number of courses.

Figures which are not surrounded by a boarder are ones that will either be calculated automatically by the spreadsheet or are preset standards. The calculated figures represent check data (such as length of course) to ensure other data has been entered correctly and the preset data include information like platform factors, civilian IDFs and maximum class sizes. The values for these preset figures can be overridden and, as will be seen in the Corporate Factor Analyser, represent three of the many corporate factors which affect the cost of a course.

If a training provider offers more than six courses then additional columns need to be added. This is a simple process of copying and pasting existing calculation cells into inserted columns.

Figure 1 shows a sample of the entry screen for the Updated Mason Model. A full demonstration and explanation of the model appears in Chapter Four.

Figure 1 **Sample Entry Screen for the Updated Mason Model**

Course Name	Course 1	Course 2	Course 3	Course 4	Course 5	Course 6	*IDF*
							Military
Max No. of Cses (OLOC)	8	4	0	0	1	1	*0.00076*
Number of Cses (PLOC)	5	4	1.3	1	1	1.5	*Civilian*
Average Course size	25	15	6	4	6	6	*0.00061*
Course Length (weeks)	21.2	30.4	4.1	2.4	35.9	3.7	
Theory **Max Size**							Platform Factor
Full Course 50				1		1	2
Large Flight 30	489		78				2
Small Flight 15	23	735					2
Squad 8			80	90	739.5	96	2
Tutoring 1							2
Practical							
Large Flight 30	244						2
Small Flight 15		370			30	45	2
Squad 8	50				390		2
One on One 1							2
Assessment							
Theory Exam 30	40	70	4	4	82	3	1.3
Practical Exam 8	4	42			196	3	2
Total Periods	850	1217	162	95	1438	148	
Total hours per course	1932	2458	321	187	2818	294	

	PLOC	Instructor Requirements						OLOC
Military								**Military**
Instructors	**18**	7.3	7.5	0.3	0.1	2.1	0.3	**22**
Senior Instructors	**1**	0.4	0.4	0.0	0.0	0.1	0.0	**1**
Testbank/Support	**2**	0.7	0.7	0.0	0.0	0.2	0.0	**2**
Civilian								**Civilian**
Instructors	**14**	5.9	6.0	0.3	0.1	1.7	0.3	**17**
Senior Instructors	**1**	0.3	0.3	0.0	0.0	0.1	0.0	**1**
Testbank/Support	**1**	0.6	0.6	0.0	0.0	0.2	0.0	**2**

Other Adjustments to the Mason Model

Chapter Two explained the concept of Mason's original model and identified its shortfalls. Prior to developing Mason's instrument into the Corporate Factor Analyser, it was necessary to update and refine the model for what it was originally intended i.e. a tool for determining instructor numbers in training schools. The proposed new model differs from Mason's in the following ways:

1. The Instructor Diversion Factor (IDF) is recalculated based on the surveys detailed later in this chapter. A separate IDF is established for military and civilian instructors with increased teaching time expected from civilian staff due to fewer military responsibilities and no sport periods allocated.

2. Rather than the numerous different lesson types as proposed by Mason, the new model uses only three broad categories (theory, practical and assessment) but divides them up by class size. This was done because of the problem identified earlier, where multiple teaching strategies are employed within a single period of instruction it is nearly impossible to employ Mason's taxonomy. Generalised platform factors have been set based on the preparation time for the three types of instruction. While these can be manipulated in the Corporate Factor Analyser, their current preset values, have been taken from Mason's original figures.[13] A more detailed study is still required to validate them.

3. The new model calculates each period of instruction using a minimum of one (whole) instructor. For larger courses (multiple classes), fractional instructors are computed. Course summaries and squadron requirements are also based on fractional instructors. As discussed in Chapter Two, smaller trades are disadvantaged in that they have less opportunities for multitasking of instructors. This is compensated for with this built in rounding for small trade courses.

---

[13] Mason (1986)

4. Calculations of Senior Instructors (SIs) and support staff are automatically indicated in the summary table. As with the original Mason Model, SIs have a proportional workload up until 20 instructors, at which time dedicated SIs can be established. Support staff are calculated on a 1:10 ratio for instructors. With the exception of Mason's out-dated references, no formal policy exists for the SI to instructor ratio nor for the establishment of support staff. As a guide however, the actual strength of Ground Training Wing in June 1996 was 19 Senior Instructors for 102 instructors. This represented a ratio of approximately 1:5 which of course appears much higher than the figures offered in this model. Caution needs to be taken that the figures for Senior Instructors are not read as dedicated positions, many in fact have a substantial teaching load as well. The data for Ground Training Wing support staff however can be taken as a more accurate guide. The number of personnel employed for training planning, assessment, development, administration, typing and library service totalled 39 as at June 1996. This provides a ratio of nearly 1:20 which is the figure used in this model. While the figures of Ground Training Wing provide some insight, they do not necessarily reflect the desired establishment ratios. A review of all Ground Training Wing posts was due at the time of this data being collected. Once this review is completed and the RNZAF provides policy guidelines on the desired ratios then the figures can be adjusted in the model.

Updating the Instructor Diversion Factor (IDF)

The Instructor Diversion Factor is an allowance made for the non teaching diversions 'which impinge on the instructor's working time eg leave, sickness, supervision, detachments, courses and various service duty absences which are normally taken into account in the calculation of an establishment'.[14] The IDF reflects the amount of time the RNZAF provides its instructors with time for welfare (leave), morale (adventure training) and professional development (Tours of Duty), which are in turn components of various corporate factors. Each of these aspects has an influence on the quality of the instructor. The IDF is also an example of how the the military factor

[14] Mason (1986) page D-9.

can be represented as a corporate factor. Activities associated with the military factor include: parades, weapon training, exercises and deployments - all of which are accounted for in the IDF.

Mason offers the following categories for calculating the IDF:

1. Leave (Annual and Statutory)
2. External courses
3. Sick and Dental
4. Service duties (other than instructional)
5. Sports (weekly and representative)
6. Aids to civil community and formal visits
7. Compassionate (Births, deaths, etc)
8. Married quarters and house purchase

To obtain more recent values for each of the above categories the following studies were performed: a leave survey, a workload survey, and an external activities survey.

The leave survey was used to gather data for the following four of Mason's IDF categories: 1.Leave (Annual and Statutory), 3.Sick and Dental, 7. Compassionate (Births, deaths, etc) and 8.Married quarters and house purchase.

The workload survey was used to obtain information about categories: 4. Service duties (other than instructional), 5. Sports (weekly - not representative) and 6. Aids to civil community and formal visits.

The external activities survey sought information about categories: 2. External courses, 4. Service duties (tours of duty to other bases and adventure training) and 5.Sports (representative rather than local). While the latter two categories are also addressed with the workload survey, this particular study focussed on the major (more than a full day) versions of these diversions.

Leave Survey

The RNZAF uses a computer database to record the 14 different types of leave awarded. The two main ones are annual and statutory leave, whereas the remaining 12 include more minor types such as household removal and witness leave. Using information from that database, all leave taken by the 80 RNZAF ground instructors during the 1993/94 leave year[15] were averaged out. The 14 categories were then reduced down to three: statutory, annual, and other. The latter being made up of all the remaining minor leave types. The first two categories were separated because they represent the greatest percentage of all leave taken. While statutory leave has not changed, the amount of annual leave awarded by the RNZAF has decreased over the years. The significance of this change justified a separate analysis. In contrast however, the amounts in the remaining categories were so small that they were combined together.

Workload Survey

A study was conducted using 15 instructors from four separate training providers located at RNZAF Based Woodbourne: the engineering school,[16] the gymnasium, Education Squadron and General Service Training School. Instructors from other schools were excluded from the study because of interruptions due to Project Recast.[17]

To maximise the accuracy of the data in this study, the subjects anonyminity had to be assured. The subjects were selected by third parties (the respective instructor's supervisors) and the instructions given for selecting the subjects made it quite clear that instructors for the study should not be selected because of their diligence nor their poor work performance. In addition to this, the third parties were asked not to make any adjustments due to the current workload of the individual. As shown in the instructions to the individuals (Appendix C), concerns about being between courses or conversely, in a particularly busy week was not important. Individuals were able to commence the study whenever they received the diary even if this did not fall on a Monday. The

[15] All Sergeants and Flight Sergeants posted to the RNZAF training schools: 2TTS, 3TTS, 4TTS, and GSTS.

[16] Number Four Technical Training School (4TTS)

[17] Under Project Recast, all ground training schools previously at Wigram were required to relocate to RNZAF Base Woodbourne during the middle of 1995. This relocation meant that instructors were not employed for normal duties.

selection of instructors was asked to be purely random, although the final selection was left to the third parties. Although larger samples are always desirable, the 15 instructors from four different training providers should have constituted a representative sample of RNZAF instructors.

The recording of data was in the form of a diary where instructors were asked to categorise their activities over a one week period. This information was then multiplied out to an 'hours per year' figure the exact calculation of what constituted an instructor's year could not be performed until the data from the leave survey was completed. The instructors were provided with the 35 categories listed in Table 4 . These categories were determined following a pilot study of the workload diary with six instructors from Numbers Two and Three Technical Training Schools.

Table 4 Categories used in the Workload Survey

Class Contact	Other Unit Duties	Other
1. Theory Lesson	16. Meetings	28. Joe Break
2. Practical Lesson	17. Parades	29. Lunch
3. Practical Assessment	18. Inspections	30. Sport / Run
4. Exam Debrief	19. Receiving Training	31. Medical
	20. OJT for other Instructors	32. Annual Leave
Supervision	21. Marking exams/homework	33. Sick/Compassionate Leave
5. Theory Exam	22. Visitors / Tours	34. Personal Business
6. Students watching a video	23. Recovery trg for student failures	35. Other
7. Students doing set work		
	Secondary Appointments	
Preparing / Writing	24. Meetings	
8. Theory lesson - set up	25. Duties / Stock takes	
9. Practical lesson - set up	26. Inspections	
10. Lesson Plans	27. Inventory Duties	
11. Instructor Guides		
12. Testbank Questions		
13. Student Assignments		
14. Class Handouts		
15. Student Reports		

The 35 categories were then simplified down to eight for analysis. These eight represented the categories in Mason's IDF calculation of: unit duties, run/sport, and secondary appointments. The other sub categories were chosen because they allowed for an indication of typical platform factors for theory and practical instruction. The eight categories used in the analysis were made up of the 35 in the study in the following way:

1. Theory Teaching

1. Theory Lesson 4. Exam Debrief 5. Theory Exam

6. Students watching a video 7. Students doing set work

2. Practical Teaching

2. Practical Lesson 3. Practical Assessment

3. Other Preparation

10. Lesson Plans 11. Instructor Guides 12. Testbank Questions

13. Student Assignments 14. Class Handouts 21. Marking exams/homework

4. Unit Duties

15. Student Reports 16. Meetings 17. Parades

18. Inspections 22. Visitors / Tours 23. Recovery trg for student failures

19. Receiving Training 20. OJT for other Instructors

5. Theory Set Up

8. Theory lesson - set up

6. Practical Set Up

9. Practical lesson - set up

7. Secondary Appointment

24. Meetings 25. Duties / Stock takes 26. Inspections

27. Inventory Duties 31. Medical

8. Sport

30. Sport / Run

Categories 28 (morning and afternoon tea) and 29 (lunch) were ignored during the analysis as they were already compensated for in the calculation of hours available per day. Categories 32 and 33 (leave) were also omitted from the analysis as they were calculated in the leave study. Where instructors indicated having taken leave, their data was computed based on the number of days worked during that week. This ensured that the results for each individual represented an average amount of work per normal day. Category 34 (personal business) was not counted in the analysis as it falls outside the budgeted allocation of working duties. Only a few instructors used Category

35 (other) and in most cases it was identified by an activity that could be allocated to one of the above categories.

Providing the instructors with more detailed categories than were used served several purposes. Firstly it conveyed a message of the expected accuracy and attention to detail in their responses. Secondly, it provided additional data that has been made available for other studies and thirdly, it provided reassurance that there were not any unexpectedly high areas within the sub categories that warranted further attention. A copy of the diary questionnaire appears in Appendix C.

External Activities Study

Because the workload survey only provided information about instructors who were at their normal place of work during the period of the study, a further study was required to account for the amount of time lost to activities away from the parent unit. Accordingly, an analysis was made using official unit records of class contact time lost due to external duties. The data were used to determine how much instructor time was lost to Tours of Duty (TOD), staff development courses, off-base sport, and expedition training. Instructional requirements at different RNZAF schools dictate an associated difference in their involvement with external commitments. For example, physical fitness instructors are more likely to play representative sport and consequently are more likely to seek their maximum entitlement. Conversely instructors of specialised skills are likely to require more time on staff development courses. Due to its size and typical instructional load Number Four Technical Training School was deemed to be a unit with the best balance of instructor types. The sample was based on all available instructors (average n = 43.25) at the school during the period August 1994 to July 1995. These dates were chosen only because they were the most up to date at the time of the data collection (August 1995). The data was sourced directly from the unit's official records.

Instructor Diversion Factor Calculation

The three studies detailed above are now used to calculate a 1995 generic calculation of the IDF. This new figure is presented in comparison with three others: Mason's original, a recently calculated figure for Number Four Technical Training School,[18] and a newly calculated value for a civilian IDF.

Due to the fact that civilian instructors should have less distractions from their primary duties they should consequently be more cost effective than RNZAF instructors.[19] The extent of this saving is measurable using the Corporate Factor Analyser in conjunction with a separate civilian Instructor Diversion Factor (IDF). To provide accurate data for calculating a civilian IDF it would be necessary to conduct similar studies to those already carried out in this report. Because the scope of this study does not permit such a detailed investigation, it is necessary to employ the more common technique of estimating the values. Using the figures derived in this study as a guide, a best guess is made of the various parts that make up the civilian IDF. In many cases they are similar to those for the military eg annual, statutory and sick leave. Others, such as sport and Tours of Duty, do not exist at all, whereas unit duties and secondary appointments require a more educated guess.

The figure derived for the civilian IDF in Chapter Four uses a mixture of the above methods. Identical values were chosen for each category with the exception of the following, which were omitted completely: adventure training, inter base sports tournaments, welfare, external courses and sport/run. While the last three do play a part in civilian contracts, they are compensated for by being allocated the same figure for unit duties and secondary appointments. In each of these two categories, civilians would be expected to have a reduced commitment in comparison with military instructors.

---

[18] This calculation was performed by Kirker (1993) as part of a Project Recast study. Although it provides a recent comparison, much of his data was approximated or taken from Mason (1986).

[19] Civilian instructors are not required to attend parades, exercises, or other military type activities. Other differences between civilian and military instructors include the fact that they are not given free dental or medical care nor many other expensive perks which are offered to service personnel.

Another adjustment is necessary to allow for the difference in hours worked per week. Civilian employees of the RNZAF only work a 37.5 hour week as opposed to the standard 40 hours of uniformed personnel. A more detailed explanation of the adjustments are contained along with the results in Chapter Four.

Both the civilian and military Instructional Diversion Factors shown in this thesis are offered only as a reference guide for future calculations. The IDF is a figure that requires regular upgrading and should be recalculated every time the model is used.

The Corporate Factor Analyser (CFA)

The CFA uses the new Mason model as a basis but goes on to include the other corporate factors associated with military training. These corporate factors were initially derived from the cost categories in the RNZAF's operating budgets for the training schools. Others, such as staff student ratios, have been included as a result of previous studies.[20] Whenever a corporate factor is selected by a user, the spreadsheet automatically calculates a range of the total course costs divided by the number of Equivalent Full Time Students (EFTS)[21] based on varying values of that corporate factor.

The corporate factors chosen for manipulation

The following variables have been pre-programmed into the model:

1 Size of course
2 Number of courses
3 Instructor salaries
4 Supervisor salaries
5 Support staff salaries
6 Consumables per course
7 Length of course
8 Annual budget for staff development

---

[20] The MOD Audit and Assessment Report Number 83 (1994) page 44 and Mason (1986) page D2 and D3.
[21] Ministry Of Education (1995)

In addition, the model can be used to experiment with various platform factors. These would normally be calculated from the preparation time required for a given type of instruction and then, once established, they would be entered into the model. They do however, represent a significant influence in the number of instructors required and consequently, the cost of a course.

In its present form, the model allows for the current value of the theory platform factor and the current value for the practical platform factor. In addition to this, an alternative value for each can be entered into the appropriate box and, when selected, the model will switch to that alternate. For example, the current platform factor for instructing practical lessons may be two, where as the instructors conducting the training might argue that they normally require one and a half hours preparation for every hour of instruction. Managers and instructors can now use the CFA model to see what influence this new platform factor will have on the cost of the course. Future developments of the CFA may permit a maximum and minimum value of certain platform factors to be entered and therefore a spread of their influence can be analysed for optimum value for money.

Using a similar method of switching, the model can be used to swap between civilian and military instructors. By selecting the appropriate box, the CFA will change from the military Instructor Diversion Factor over to a civilian one. In this early version of the model, such a method addresses the major differences between the two types of instructors. To ensure that the model is accurate, consideration needs to be given to adjusting the salary of the instructor. Not only are civilian and military instructors paid different salaries but there is a string of intangible aspects offered to the service person that are not offered to civilians. For example: free uniforms, allowance for military duties, and free dental and medical care. These are the very same elements that Moskos refers to as separating the institutionalism of the military from the occupationalism of the civilian world. While those intangibles listed above represent the perks of the RNZAF in 1996, many of them are being eroded away as a result of budget cuts. For as long as such difference do exist however, their costs should be calculated out and included in the differences in salaries. The scope of this study has precluded a detailed analysis of these costs. Future studies may be in a position to determine how much more, or less, it costs to employ a military instructor over a civilian one.

Appearance of the Selection Screen

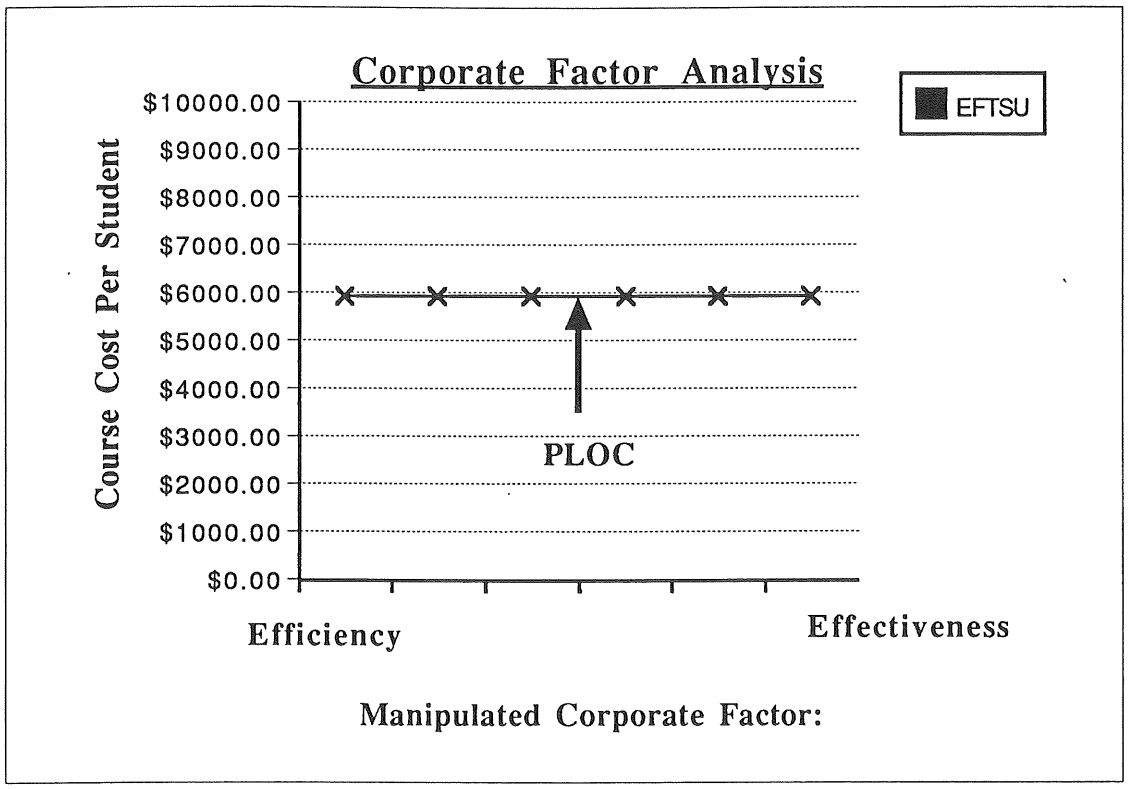
Figure 2 shows the CFA screen as viewed when selecting a corporate factor for analysis. The column labelled PLOC indicates the current values for each element. When a check box is marked, the spreadsheet overrides the standard value and computes the cost of the course for six different configurations ranging from the *Efficiency* value through to the *Effectiveness* value. The term *Efficiency* is used to indicate the most economical configuration. *Effectiveness* represents the opposite end of the spectrum where there is a higher priority placed on quality (regardless of cost). While the figures used for *Effectiveness* and *Efficiency* in this demonstration have been based on typical minimum and maximum values for the Instructional Techniques Course, they are unsubstantiated through policy documents or studies. As discussed earlier, both effectiveness and efficiency are subjective concepts. The RNZAF would need to determine what levels and values it will use when the model is to be applied in earnest.

Figure 2 The CFA Selection Screen

	Corporate Factors	PLOC	Efficiency	Effectiveness
	Small Class Size (max)	15	22.5	7.5
	Large Class Size (max)	30	45	15
1	Staff Development	$0.00	$0.00	$10,000.00
1	Size of Course	10	15	5
1	Number of Courses	8	12	1
	Length of Course (days)	18	9	27
	Enter PLOC course length ->	18		
1	Instructor Salaries	$38,000.00	$25,000.00	$50,000.00
1	Supervisor Salaries	$48,000.00	$30,000.00	$55,000.00
	Support Staff Salaries	$20,000.00	$18,000.00	$30,000.00
	Consumables per course	$916.25	$458.12	$1,832.50
	Enter annual budget here ->	$7,330.00	$3,665.00	$10,995.00
	Hours worked per day	7.6	11.4	3.8
	Δ to civilian Instructors	Military	Civilian	<- Alternate
	Theory Platform Factor	2	2.5	<- Alternate
	Practical Platform Factor	2	3	<- Alternate

The results are then presented in both a graphical and tabulated form. Figure 3 shows how the graph appears when no corporate factors have been selected. All values (from *Efficiency* through to *Effectiveness*) are equal in the example shown, a straight line occurs at $5,921.00 which is the present (PLOC) cost of that course. The arrow on the graph, indicates the point midway between *Efficiency* and *Effectiveness*. When only one corporate factor is selected for manipulation, the graph will pivot around the top of the arrowhead.

Figure 3 **Corporate Factor Analyser Graph: Without Manipulation**



Using the Model

The model is designed to be adapted for individual analyses. Due to the differences in RNZAF courses, no generic model could ever be comprehensive enough. Common sense would also need to be used for an accurate application.

While additional categories can be added, omitted or combined, the general concept is that users enter data into appropriate boxed cells on the spreadsheet. As with the updated Mason Model, figures without cell boarders, are calculations performed automatically by the spreadsheet.

Demonstration of the Model

To demonstrate the model, the RNZAF's Instructional Techniques Course (ITC) was chosen. Using the budgeted operating costs for the 1995/96 Financial Year and the current course details[22] the demonstration shows the analyses of three separate studies. The manipulated corporate factors chosen were: the size of course, the instructor salaries, and then a combination of staff development, size of course, instructor salaries and supervisor salaries.

For all three analyses, graphs are presented to show the influence that each of these corporate factors have on the cost of this course.

An expanded version, showing formulae, is presented in Appendix D.

22 The PLOC configuration of the course includes the standard number of courses per year, length of course, hours per working day and the average number of students per course.

Chapter 4

Results and Discussion

The results are presented in order of the three investigations: Self-Selection, Inculcation, and Separating Corporate Factors from Inefficiencies (The Corporate Factor Analyser and the studies involved with up dating the Mason model).

4.1 Self Selection

The investigation into self-selection of the military culture has been divided into two groups. The first compares recruits with enlisted personnel and the second compares officer cadets with serving officers.

Self-Selection Part One : Recruits versus Enlisted Personnel

The scores of the four IBMTs (recruit courses) are compared with the first control group (enlisted personnel) in Table 5. The scores for enlisted personnel have been presented in groups based on length of service.

Table 6 shows that new recruits hold significantly better attitudes towards the military (in terms of primacy and scope combined) than the average service person with less than 10 years service and similar attitudes to the entire sample of all enlisted personnel. Because the recruits did not have lower scores than the control group, the self-selection theory appears valid.

The correlation between Military Ethos Scale (MES)[1] scores and length of service for the first control group (enlisted personnel) was almost perfect (r=0.995).This increase in pro-military attitudes, with respect to length of service, was expected because personnel who do not score high

[1] This is the name of Cotton's instrument for measuring military ethos attitudes - Cotton (1981).

on the MES are likely to resign from the military earlier than those who do score higher. Over time, those with longer lengths of service will have more positive attitudes toward the military.

Table 5 Combined MES Scores of Recruits and Enlisted Personnel

Recruits vs. Enlisted Personnel					
		Combined MES Scores			
Groups	***n***	**Average**	**Minimum**	**Maximum**	**Std Dev**
Recruits					
AFCDTs R2/95	51	15.49	9	24	3.34
AFCDTs R3/95	71	16.73	7	26	4.11
AFCDTs R4/95	53	17.45	9	29	4.48
AFCDTs R1/96	94	15.01	10	24	3.09
Combined	269	*16.07*	*7*	*29*	*3.82*
Enlisted Personnel					
< 5 years service	23	14.50	8	25	4.37
5-9 years service	62	15.10	6	25	4.10
10-14 years service	28	16.48	6	22	3.14
15-19 years service	23	17.61	11	26	3.29
20-25 years service	3	19.00	7	25	6.45
25+ years service	3	20.33	19	21	1.15
Average <10yrs	85	*14.70*	*6*	*25*	*4.14*
Average (overall)	142	*15.81*	*6*	*26*	*4.17*

Table 6 One Group t Test Scores of Recruits versus Enlisted Personnel

	df	*Sample Mean* *Recruits*	*Pop. Mean* *Enlisted Personnel*	*t value*	*Prob.*
<10yrs Service	268	16.07	14.70	5.87	0.0001
Entire Control Group	268	16.07	15.81	1.10	0.2710

Based on the findings of this study, and the indications of previous research, this thesis contends

that the RNZAF does in fact self-select its military attitudes by recruiting personnel who already share the traditional military values to the enlisted servicemen and women.

Gender Comparisons and Analyses

To investigate the possibility of differences by gender, two analyses between recruits and enlisted personnel were performed using the above data after separating them into male and female groups. As shown in the tables below, no gender differences were found with new recruits or with those who had served less than 10 years. In the analyses within gender groups, female recruits were found to score significantly lower than both of the two female control groups. With the male recruits however, the scores were significantly lower than the entire male control sample but there was no significant difference with the 'less than 10 years service' group.

Table 7 **Summary of MES Scores by Gender**

Recruits vs. Enlisted Personnel (Gender Analysis)					
		MES Scores			
Groups	***n***	**Average**	**Minimum**	**Maximum**	**Std Dev**
Male Recruits					
Combined	200	16.16	7	28	3.75
Enlisted Males					
<10yrs Service	59	15.66	8	25	4.37
Entire Control Group	132	16.80	7	26	4.27
Female Recruits					
Combined	69	15.81	9	29	4.03
Enlisted Females					
<10yrs Service	39	14.45	6	24	4.27
Entire Control Group	49	14.82	6	24	4.04

Table 8 t-Test Scores of Male Recruits versus Enlisted Males

Males	*df*	*Sample Mean* *Recruits*	*Pop. Mean* *Enlisted Personnel*	*t value*	*Prob.*
<10yrs Service	199	16.16	15.66	1.87	0.0636
Entire Control Group	199	16.16	16.80	-2.43	0.0160

Although no significant difference was found between the male recruits and the 'less than 10 years' cohort, the male recruits did score significantly lower than the entire sample of enlisted males.

Table 9 t-Test Scores of Female Recruits versus Enlisted Females

Females	*df*	*Sample Mean* *Recruits*	*Pop. Mean* *Enlisted Personnel*	*t value*	*Prob.*
<10yrs Service	68	15.81	14.45	2.81	0.0065
Entire Control Group	68	15.81	14.82	2.05	0.0447

Unlike the male analysis, significant differences were found between the females recruits and both control groups. In each case, the female recruits scored higher than their longer serving colleagues.

Gender Comparisons

In the following two tables, the two female samples are compared with their respective male cohorts. In both cases, one tailed, one group t-Tests have been performed using the average male MES score as the population mean and the female's scores as the sample mean.

Table 10 t-Test Scores of Female Recruits versus Male Recruits

Recruits	*df*	*Sample Mean* *Female*	*Pop. Mean* *Male*	*t value*	*Prob.*
Combined	68	15.81	16.16	-0.72	0.4748

Table 10 clearly showed that there was no significant gender difference in primacy and scope for personnel who had just joined the RNZAF.

Table 11 **t-Test Scores of Enlisted Females versus Enlisted Males**

Enlisted	*df*	*Sample Mean* *Female*	*Pop. Mean* *Male*	*t value*	*Prob.*
< 10 years	37	14.45	15.66	-1.75	0.0885
All RNZAF	48	14.82	16.80	-3.44	0.0012

No significant difference was found when comparing the two groups who had served less than ten years although the difference was very significant between enlisted males and enlisted females for the combined samples.

The findings of the gender analyses and comparisons are consistent with the claims of Segal et al,[2] Segal,[3] Moskos and Wood,[4] and Dunivin.[5] These people claimed that there is no genetic or social reasons, external to the military, why gender differences should exist. They went on to argue however, that differences will continue to exist until the traditional 'combat masculine warrior'[6] attitude of the military erodes completely. Because of the imposed policies and social pressures, those with greater exposure to the military would be expected to show the greatest differences. This was in fact the finding of this study; those newer to the military showed no gender differences yet those in the control group, showed a very significant difference. The implications from this finding suggest that no concerns should be expressed about allowing females into previously male dominated domains on the grounds that they are not capable of holding the same traditional military attitudes and values. In addition to this, concerns should be raised toward any barriers (policy or social) which may impact on the natural development of both groups' attitudes.

---

2 Segal et al (1979) page 123.

3 Mady Segal *in Moskos and Wood (1989)*

4 This analysis was based on 1985 data. Moskos and Wood (1989) page 285.

5 Dunivin (1994) page 533.

6 See Dunivin (1994) page 533-4 for an explanation of her CMW paradigm.

Self Selection Part Two : Officer Cadets versus Serving Officers

The scores of newly recruited officer cadets are compared with those of the second control group (serving officers) in the following table.

Table 12 **Combined MES Scores of Officer Cadets and Officers**

Officer Cadets vs. Serving Officers					
		Combined MES Scores			
Groups	***n***	**Average**	**Minimum**	**Maximum**	**Std Dev**
Officer Cadets					
OCDTs 1/95 IOTC	21	19.54	13	26	3.92
OCDTs R3/95	15	19.20	14	25	3.53
OCDTs R1/96	25	16.84	10	24	3.68
Combined	*61*	*18.34*	*10*	*26*	*3.88*
Serving Officers					
< 5 years service	7	18.64	16	23	2.06
5-9 years service	13	18.82	14	25	3.57
10-14 years service	5	15.60	12	20	3.36
15-19 years service	4	20.83	17	25	3.13
20-25 years service	4	23.33	21	25	2.08
Average <10yrs	20	*18.79*	*14*	*25*	*2.70*
Average (officers)	33	*19.09*	*12*	*25*	*3.39*

Table 13 **One Group t Test Scores of Officer Cadets versus Serving Officers**

	df	*Sample Mean* *OCDTs*	*Pop. Mean* *Serving Officers*	*t value*	*Prob.*
< 10 years	60	18.34	18.79	-0.897	0.373
All RNZAF	60	18.34	19.09	-1.501	0.139

The officer cadets did not score significantly lower than the longer serving officer cohort. This validates the argument for self-selection, as opposed to inculcation.

The correlation between MES scores and length of service for serving officers was not as high as that for enlisted personnel (*r= 0.64*).[7] Officers appear to be more consistent over time and, as expected, scored higher than the enlisted ranks. Table 13 shows that there was no significant difference between the officer cadets and either of the two officer control groups.

In both the enlisted ranks and the officer corps, self-selection appears to be the dominant cause for the military culture (in terms of primacy and scope).

4.2 The Inculcation of Military Values during Formal Training

The following analyses show the change in attitudes of students whilst attending various RNZAF courses. Gender comparisons were made for the two large courses (R2/95 and R3/95). The remaining courses had insufficient female numbers to warrant analyses. The results are presented in the following order: General Service courses, Promotion courses and finally Trade courses.

Inculcation Part One: General Service Courses

These are the initial courses undertaken by all new recruits (both officers and other ranks) upon enlistment into the RNZAF. It is in these courses that the inculcation of military values (the military factor) is expected to be most dominant.

[7] This figure was calculated using single year groups rather than the five year groups that were used for the presentation of data in the table.

R2/95 Initial Basic Military Training (IBMT)

Table 14 shows that the scores of these personnel were significantly higher on graduation than they were on entry.

Table 14 R2/95 Pre- and Post-Course MES Scores

R2/95	Combined Mean	Minimum	Maximum	Std Dev
Pre-Course	15.49	9	24	3.343
Post-Course	17.39	6	26	3.858

R2/95	*df*	*Post-Pre*	*t value*	*Prob.*
Female				
Scope	15	1.62	2.97	0.0048
Primacy	15	0.81	1.65	0.0602
Combined Score	15	2.44	3.29	0.0025
Male				
Scope	34	0.91	1.67	0.0526
Primacy	34	0.74	1.83	0.0383
Combined Score	34	1.66	2.99	0.0026
Whole Course				
Scope	50	1.14	2.75	0.0041
Primacy	50	0.76	2.42	0.0096
Combined Score	50	1.90	4.28	0.0001

With the exception of primacy for females and scope for males, all analyses produced significant increases.

R3/95 Initial Basic Military Training (IBMT)

This course differed from R2/95 in that it contained officer cadets. The officer cadets undergo the same basic military training as recruits prior to commencing their officer training. To allow for fairer comparisons between courses the officer cadet data (n=15) were excluded from this analysis. Their influence on the other course members and the progression of the course in terms of attitudes to the service is unknown.

Table 15 R3/95 Pre- and Post-Course MES Scores

R3/95	Combined Mean	Minimum	Maximum	Std Dev
Pre-Course	17.38	9	26	3.95
Post-Course	17.48	10	25	3.64

R3/95	*df*	*Post-Pre*	*t value*	*Prob.*
Female				
Scope	14	0.00	0.00	------
Primacy	14	-1.20	-1.65	0.0601
Combined Score	14	-1.20	-1.34	0.1008
Male				
Scope	45	-0.39	-1.16	0.1258
Primacy	45	0.91	1.97	0.0338
Combined Score	45	0.52	0.90	0.1864
Whole Course				
Scope	60	-0.30	-1.11	0.1366
Primacy	60	-1.20	-1.65	0.0601
Combined Score	60	0.10	0.02	0.4216

The only significant difference for R3/95 was an increase in primacy for males. However, it should be noted this course started with a very high mean score. In most cases there was a slight decline in the MES scores, although not one of these was statistically significant.

1/95 Initial Officer Training Course (IOTC)

This is the only course in the study that focused on the progress of officer cadets during their initial officer training. Primacy and scope are two issues which are consciously promoted throughout the course and the results were expected to show a significant increase in both measures. As Table 16 shows however, the post-score was in fact lower on graduation than on entry.

Table 16 1/95 IOTC Pre- and Post-Course MES Scores

IOTC	Combined Mean	Minimum	Maximum	Std Dev
Pre-Course	19.466	13	24	3.522
Post-Course	18.733	9	25	4.712

IOTC	*df*	*Post-Pre*	*t value*	*Prob.*
Scope	14	-0.40	-0.72	0.2430
Primacy	14	-0.33	-0.64	0.2669
Combined Score	14	-0.73	-0.77	0.2249

No significant differences were observed between the pre- and post-course scores for the Initial Officer Training Course in either scope, primacy or combined. In each case however, the scores decreased.

Discussion of Initial Courses (IBMT and IOTC) Results

These courses were all expected to produce the most significant results as they actively promote military values, both in training and in assessment. R2/95 IBMT was the only course however, that produced an overall significant increase in student attitudes towards the RNZAF.

While R2/95 IBMT produced many significant increases, R3/95 did not. Although this appears surprising, it is worth noting the disparity in their pre-course scores. The difference between R2 and R3/95, on pretest, was significant ($p=0.0002$). While difficult to explain this difference, it is interesting to note that both courses graduated with similar levels. It would appear that the graduating level displayed by these two groups is the required[8] standard to which the IBMT inculcates military attitudes. Because R2/95 did increase pro-military attitudes there is evidence to suggest that some courses are capable of teaching the military factor but are not always required to do so because the entry level of students is sometimes already at an acceptable standard. This

[8] The term 'required' is used on the assumption that the instructors teaching this course are satisfied with the standard achieved by the graduating students. Whether the 'level achieved' is the same as the 'level required,' is up to the RNZAF. No formal guidelines or criteria exist for such an evaluation.

report can only speculate what would happen for students attending courses at civilian institutes. It is possible that civilian training might have a negative influence on student's military attitudes as opposed to service courses which might maintain the status quo. If this claim was substantiated, it could be a valid reason for the RNZAF retaining its own in-house training.

Anecdotal evidence supports the finding that each recruit course differs markedly depending on the time of year in which it occurs. For example, the first and third for each year differ from the other two in the fact that they contain officer cadets. Courses also differ because of the type of recruits that join at different times of the year. For example, the first courses for each year are generally made up of recruits who have progressed from their secondary school education in a planned career path. Although selective recruiting for specific trades has an influence,[9] other courses are generally more variable in their make-up.

The results of the IOTC support the hypothesis that self-selection plays an important part in military values. As a whole, the officer cadets on this course displayed a consistent score on their attitudes of primacy or scope. Although the average score for officers appears high, overseas research supports the fact that officers should not be compared directly with enlisted personnel. The role and expectations of officers mean that officers will score higher on institutional measures.[10]

[9] Selective recruiting refers to how the RNZAF delay recruiting personnel for some smaller trades until sufficient numbers exist to warrant running specialist trade training courses eg military police.

[10] Sørensen (1994).

Inculcation Part Two: Promotion Courses

The two promotion courses chosen for this part of the study include one senior Non-Commissioned Officer promotion course (Flight Sergeant Qualifying) and one junior officer promotion course (Junior Officers Executive Course). Both courses are conducted under Ground Training Wing at RNZAF Base Woodbourne by the same Squadrons (schools) that teach the two initial training courses (IBMT and IOTC). While they are not as heavily orientated toward the military as the initial courses are, they are both expected to yield positive increases in military attitudes.

Junior Officers Executive Course (JOEC)

This course is a prerequisite for all Flying Officers prior to promotion to Flight Lieutenant. Personnel from various backgrounds and jobs are brought together for a junior management type course. It is not solely orientated at military skills but does include a certain amount of general service training. The results were not expected to be as high as were for the initial officer training course (IOTC) but some degree of military factor was possible. As Table 17 shows, the only significant difference found with this course was a decrease in primacy.

Table 17 1/95 JOEC Pre- and Post-Course MES Scores

JOEC	Combined Mean	Minimum	Maximum	Std Dev
Pre-Course	18.166	14	21	2.4832
Post-Course	17.833	15	20	1.9407

JOEC	*df*	*Post-Pre*	*t value*	*Prob.*
Whole Course				
Scope	5	0.50	0.89	0.2075
Primacy	5	-0.83	-2.71	0.0211
Combined Score	5	-0.33	-0.50	0.3191

Flight Sergeant Qualifying Course (FQC)

This course is a military/management course conducted at General Service Training Squadron. Due to its military nature, significant increases on the MES were expected.

Table 18 2/95 FQC Pre- and Post-Course MES Scores

FQC	Combined Mean	Minimum	Maximum	Std Dev
Pre-Course	17.833	14	22	2.886
Post-Course	17.911	12	23	3.315

FQC	*df*	*Post-Pre*	*t value*	*Prob.*
Whole Course				
Scope	11	1.17	2.18	0.0258
Primacy	11	-1.08	-2.32	0.0205
Combined Score	11	0.08	-0.12	0.4538

Two significant differences were observed in this course. Students attending the FQC appeared to increase their attitudes of scope but decrease their attitudes of primacy. No significant difference was found on the combined score.

Combined Discussion of the Promotion Courses (JOEC and FQC)

The students attending either of these two courses have served for several years with the RNZAF. The JOEC is attended by officers after approximately five years of service and the FQC is attended by experienced senior NCOs. For 2/95 FQC the average length of service was 15.3 years and the average age was 32.7 years.

As these students had already been immersed in the greater culture of the RNZAF for a long time, it was surprising that the respective courses had such mixed influences on student military attitudes.

Inculcation Part Three: Trade Courses

Like the two promotion courses chosen, the two trade courses include both officers and other ranks. The courses were: Basic Engineering and the Aircrew Instructional Techniques. The latter course was made up of both officer and NCO aircrew.

2/95 Basic Engineering (BE) Course

Basic Engineering was one course that the MOD Audit Report argued should be taught by an external provider. The RNZAF defend their training system on the grounds that these courses, despite not having any specific military content, contained the elusive military factor. Table 19 shows that all three analyses (scope, primacy, and combined) indicated a decline in pro military attitudes as a result of this course, although only primacy was significant.

Table 19 2/95 BE Pre- and Post-Course MES Scores

BE	Combined Mean	Minimum	Maximum	Std Dev
Pre-Course	14.385	8	20	3.034
Post-Course	13.462	9	22	3.165

2/95 BE	*df*	*Post-Pre*	*t value*	*Prob.*
Whole Course				
Scope	25	-0.08	-0.19	0.4258
Primacy	25	-0.85	-2.03	0.0268
Combined Score	25	-0.92	-1.55	0.0666

Basic Engineering is a primary trade course[11] and the students are likely to be unwinding following their intensive recruit course. The downward trend in their attitudes therefore, was not surprising. Because the combined results were not significant it would appear that this course was consistent in maintaining the military values as measured by this study. The decrease in primacy scores for this course was consistent with the finding for promotion courses.

11 Primary Trade Courses follow immediately after recruit training with little or no exposure to the workplace and culture of the greater RNZAF.

2/95 Aircrew Instructional Techniques Course (AITC)

The AITC differs from all other courses because it is made up of both officers and enlisted personnel. It is similar to the JOEC and FQC in terms of the age and length of service of the students. Based on the scores of those previous courses, the lack of any significant difference was not expected. Table 20 shows the breakdown of primacy, scope and combined MES scores.

Table 20 2/95 AITC Pre- and Post-Course MES Scores

AITC	Combined Mean	Minimum	Maximum	Std Dev
Pre-Course	16.6363	11	25	3.905
Post-Course	17.2727	9	22	4.197

AITC	*df*	*Post-Pre*	*t value*	*Prob.*
Whole Course				
Scope	10	0.00	0.00	------
Primacy	10	0.64	0.84	0.2092
Combined Score	10	0.64	0.58	0.2874

The MES scores from 2/95 AITC indicate that the Aircrew Instructional Techniques Course has no military factor in terms of promoting positive attitudes towards the RNZAF in particular, primacy and scope. Unless it could be shown that these attitudes would decrease as a result of using civilian contractors, it would seem obvious to seek the most economical training provider. If an outside organisation could provide the course at a cheaper rate, then the RNZAF should consider it. The question of quality would then become the greatest focus. This issue of quality, in terms of educational evaluation, is extremely complicated to measure.

4.3 Separating Inefficiencies From Corporate Factors

The results of several studies are presented in this section. Firstly the various studies used to update the Instructor Diversion Factor for the Mason model and then the updated model is itself demonstrated. Finally, the Corporate Factor Analyser model, developed for evaluating corporate factors in terms of their cost, is presented and tested.

The Instructor Diversion Factor (IDF)

The Instructor Diversion Factor represents a significant part in the Mason model that calculates the staffing levels for RNZAF training providers. The staffing levels have a major impact on class sizes and number of courses, both of which are important corporate factors. To ensure accurate data is used in the Corporate Factor Analyser it has been necessary to review the Instructor Diversion Factor. Prior to presenting several comparative IDF values, the results of three studies are detailed: The Leave Survey, The Workload Survey, and The External Activities Survey.

The Instructor Diversion Factor (IDF) : Leave Survey

This study involved an analysis of all leave taken by RNZAF instructors during the 1993/94 leave year.[12] The results are presented in Table 21.

The RNZAF's database records indicate only 5.7 Statutory holidays were taken. While it is accepted that some staff may have worked a few public holidays it is more likely that in most cases, personnel simply did not submit the appropriate paperwork. The reality being that most instructors will have taken their full entitlement of statutory leave. It is also likely that many half-day sick leave may not have been recorded. No compensation has been made for the half-day sick leave but there is sufficient grounds to adjust the statutory leave value.

---

[12] The current *leave year* system for the RNZAF is 1 October through to 31 September.

Table 21 Summary of Leave Survey

Annual Leave	AL	20.56		
Statutory	STL	5.70	NZ Public Holidays	13
			Defence Force Holidays	2
Compassionate	CL	0.65	**Total Statutory**	15
Travel Time	TT	0.32		
Household Removal	HRL	0.62		
Stand Down	SD	0.56		
Resettlement	RSL	0.56		
Bereavement	BL	0.05		
Long Leave	LL	1.05		
Equivalent	EQL	0.49		
Anticipated	ANT	0.41		
Special Stand Down	SSD	0.32		
Sick	SL	0.10		
Witness Leave	WL	0.01		
	Sub Total	**5.14**	(excluding AL and STL)	
Recorded Leave Taken		**31.4**	(based on data available)	
Proposed Realistic Leave Taken		**40.7**	(Using 15 days STL)	

The Instructor Diversion Factor (IDF) : Workload Survey

Data for this part of the study was collected through diaries kept by instructors over a one week period. Of greatest interest from this study was the amount of teaching time lost due to unit duties[13] and secondary appointments.[14] Other non-teaching type activities that would also have been identified in this study include: parades, annual weapon shoots, daily fitness training and weekly sport. This study also provided reference data for future studies investigating platform factors.[15] The results are summarised in Table 22.

[13] Unit duties include administration of student reports and other responsibilities within the training unit.

[14] Secondary Appointments include responsibilities external to the training unit ie: Sports clubs, Mess appointments, and disciplinary tasks such as NCO ic of Barrack Blocks.

[15] Platform Factors refer to the ratio of preparation to class contact time - see Appendix B.

Table 22 Summary of Workload Survey (hours per week)

Participant	Activity Type									
	Theory	Set Up	Practical	Set Up	Other Teaching	Prep	Unit Duties	Secondary Appoint	Sport	**Total**
1	3	0.25	0	0	0	7	8	5.25	0	**23.50**
2	4	2.75	2.5	1	3	16.25	8.5	3	0	**41.00**
3	7.5	0.5	4	0	0	7	17	1	0	**37.00**
4	0	0	3	1	0	20	5.5	3	0	**32.50**
5	8.5	1	6.5	0	1	18.5	13	1.25	0	**49.75**
6	5.5	6.5	0	0	0.5	13.5	12.5	4	0	**42.50**
7	9	0	9	0	4	4	1.75	4	1.5	**33.25**
8	15.5	2.5	0	0	0	14	0	0.75	0	**32.75**
9	7.5	1	5	0.5	0	13	5	1	0	**33.00**
10	5	4	0	0	0	17	1.25	0	0	**27.25**
11	0	0	0	0	0	10.5	14.7	9.3	2.1	**36.60**
12	14	0.5	0	0	0	6	0	0	1	**21.50**
13	0	0	10	7	2.5	12	5	1.25	3	**40.75**
14	12.75	0	0	0	0	14	0	0	2	**28.75**
15	0	0	12	11.75	0	0	0	0.5	7	**31.25**
Average Time Spent										
	6.15	**1.27**	**3.47**	**1.42**	**0.73**	**11.52**	**6.15**	**2.29**	**1.11**	**34.09**

Hours spent per week

Class Contact	10.35	(theory, practical and other teaching)
Preparation	14.20	(theory and practical set up, and other preparation)
Unit Duties	6.15	
Secondary Appointments	2.29	
Sport	1.11	
Total	**34.09**	
Other	5.91	(activities not accounted for in other categories)

For the 10 hours of class contact, the instructors in this study spent 14 hours in preparation. This suggests that the Platform Factor should average out to 2.4 (1 hour 25 minutes preparation for every hour of teaching). While interesting in itself, these data need a reference frame before any conclusions can be drawn. A more substantive discussion follows the comparison between the results of this study and the equivalent figures offered by Mason.

The Instructor Diversion Factor (IDF) : External Activities Survey

This study shows the actual time lost from the primary duty of instructing due to duties or taskings away from the parent base. While the data presented in Table 22 reflects the total time taken, consideration needs to be made to the level of establishment and workload. When units are understaffed, then these activities are often the first to be sacrificed. Conversely, when there are quieter periods in training, then staff are available for their own professional development. The data presented in Table 23 shows actual time lost as opposed to that which was requested or planned.

Table 23 Summary of 4TTS Lost Periods (August 94-July 95)[16]

Date	Strength	Total Days Lost				Periods per Instructor	% of Establishment*
		TOD	Courses	Sport	Exped		
Aug	46	19	10			5.0	92.00
Sep	48	33	20			8.8	96.00
Oct	46	20	61			14.1	92.00
Nov	46	87				15.1	92.00
Dec	45	13				2.3	90.00
Jan 95	47	8	5	2		2.6	94.00
Feb	46	19	56		144	38.1	92.00
Mar	45		53	8	16	13.7	90.00
Apr	44	10	14			4.4	88.00
May	35		19	12		7.1	83.33
Jun	36	3		8		2.4	85.71
Jul	35	31		10		9.4	83.33

Average Time Lost Per Instructor						Average % of Establishment
	TOD	Courses	Sport	Exped	Overall	
Days Lost	5.62	5.50	0.92	3.70	15.75	89.87
Periods Lost	44.95	44.02	7.40	29.60	125.97	

* Instructor Establishment (excluding officers and administration staff) was 50 up until April 1995 at which time it was reduced to 42 when 8 positions were transferred to Ground Training Wing Headquarters.

[16] *Appreciation is extended to FLTLT Dave Henderson for his compilation of this data.*

Terminology	
TOD (Tour of Duty)	generally refers to staff visits to other bases for meetings or discussions
Courses	refers to formal courses both military and civilian.
Sport	refers to trips away (Interbase and Interservice) rather than local sport.
Exped.	Expedition or adventure training for instructors rather than staffing adventure training as part of course requirements for students.

The Instructor Diversion Factor (IDF) : Actual Calculations

The table below shows four calculations of the Instructor Diversion Factor: Mason, Kirker,[17] and the two new ones offered by this thesis (1995 actual data and the estimated civilian one). The various figures used for calculating the new 'military' IDF are derived from the three surveys already listed. The figures from the leave and external activities surveys were expressed as hours per year and were able to be inserted straight into the calculation. The data from the workload survey was not just an 'hours per week' figure but an 'hours per typical working week.' To adjust the data from this study into a typical working week type result, it was necessary to adjust it by the number of normal weeks spent in the parent unit performing mainly primary appointments. For example, it would be inaccurate to attribute time spent attending meetings when a person was on leave. To adjust for time lost to leave, the data from the workload survey was multiplied by 41.3 (rather than 52) to convert it from a weekly figure to an annual figure. Forty one point three was obtained by subtracting the 8 weeks (40.7 days) of leave and 2.7 weeks (13.51 days) of external activities from the total of 52 weeks in a year. This gave a figure that represented the amount of work time lost from a normal day spent at the instructor's place of work.

[17] Kirker (1993)

Table 24 Instructor Diversion Factor Comparisons

	1986 (Mason)	1994 (Kirker)	Projected Civilian	This Study
	Periods	*Periods*	*Periods*	*Periods*
Total Available	2080	2080	1950	2080
Statutory Holidays		280.0	112.5	120.0
Annual leave	311.2		154.2	164.5
Comp, Sick, HHR leave	46.2	32.0	38.5	41.1
Adventure Trg / Interbase	40.0	40.0		31.7
Welfare -Personal Admin, Pay, etc	10.0	8.0		
External Courses & TODs	58.0	40.0		76.3
Unit Duties	12.6	12.0	211.5	211.5
Sport/Run	101.1	104.0		38.0
Secondary appointments	96.0	96.0	78.9	78.9
Lost hours per year	675.1	612.0	595.6	761.9
Contact time Available	1404.9	1468.0	1354.4	1318.1
Instructor Diversion Factor	0.00071	0.00068	0.00074	0.00076

The above figures represent the degree of variation between previous (theoretical) time allocations and actual data collected during the mid 1990s. The results of the various studies from this thesis indicate that the actual amount of instructional time lost to non-teaching activities is higher than previously thought. With the ten years difference between Mason's calculations and this study, the differences in IDF could have been attributed to the different roles expected of RNZAF instructors today.

The calculation of the civilian IDF is provided so the model can be used to determine whether the RNZAF should employ civilian instructors in their training institutes. The calculations were based on similar data as the survey results, for all tasks except Adventure Training and Sport. As with the calculation for the military IDF, time for personal welfare etc have been included in the figure for Unit Duties. The other major difference between the civilian and military calculation is the number of periods available per year. Because civilian employees of the RNZAF only work a 37.5 hour week, the number of hours that they are available is reduced. The figure normally used for

available periods is 2080. This has been multiplied by 37.5 and then divided by 40 to derive the more accurate figure of 1950. The same adjustment has been made for the three categories of leave. To convert the figure of days per year into periods (hours) per year the data from the leave study were multiplied by 7.5 rather than eight. The resultant difference between civilian and military instructors is an IDF of 0.00074 instead of 0.00076. In itself, this information appears meaningless. To become useful, an analyst needs to employ the Corporate Factor Analyser to contrast the actual difference in course costs using civilian, as opposed to military, instructors.

The major differences between Mason's theoretical data and the actual results of this report's collective studies are: leave, Interbase/Adventure Training, Unit Duties, and personal fitness training (running and weekly sport). The differences in leave is not surprising considering the RNZAF's reduction in the amount of annual leave it now awards. Special leave has remained fairly constant yet Adventure Training and Tours of Duty have dropped by nearly a quarter from Mason's figures. The figure Mason offers for personal welfare and administration has been combined in this study with the value for unit duties.[18] Data from the workload survey indicated that less time was being taken for sport than Mason budgeted on. This reflects the higher demands of additional unit duties. Where an instructor is required to attend more meetings and write reports then less time will be available for activities such as personal fitness. The column indicating the unit's strength, as a percentage of established positions, is important here. If the unit was significantly understaffed then instructors would not be permitted to take as many external activities (courses or adventure training). The overall staffing of the unit averaged at 90% for the period of the study.

As an alternate theory on the disparity, the instructors at this training unit may be more diligent and committed to providing their students with better quality instruction and chose not to take sport even when it was available.

---

[18] The reason for this was because the data collected from the workload survey indicated that personal administrative and welfare never represented a full hour. Instructors combined this activity into periods where unit administration was performed.

Although it is interesting to speculate on what cultural and political changes may have occurred of the 10 year period, for the purposes of calculating this IDF, it does not matter how the instructors divided up their non-contact time. What really counts is the total amount of time lost from instructing or instructing related duties. By combining Mason's welfare, unit duties, and sport/run categories, the total equals 123.7 hours. This can be contrasted with the same categories in the survey data which total to 249.5 hours - more than double. While it is accepted that the role of an instructor has changed over the years the difference does seem extreme.

One possible explanation is that the instructors involved in the survey were inaccurate in their time allocation. Unit duties is a broad heading and perhaps a convenient scapegoat for a variety of other minor tasks in addition to personal welfare. As mentioned earlier, the staffing levels of the unit would make a big difference to the time spent on different activities. Instructors who were teaching constantly would proportion out their time so that only urgent and necessary administrative tasks were performed. Because the workload survey involved instructors from so many different units, it is unlikely that they were all significantly understaffed at the time of the study. Consideration does need to be given to establishment levels when performing future studies like this one on single units (in case levels of under- or overstaffing are significant). Ironically however, if an establishment review is being performed then it suggests that the true level of under or overstaffing is unknown.

Another possibility for the higher figure is the fact that instructors may be required to perform more non-teaching duties than the RNZAF's management realise. Of some consolation, the data gathered in 1995 indicates that less time is taken for sport and secondary duties than used to be. The overall difference, for all categories, between Mason's IDF and the data gathered in this study is 86.8 hours. This represents a increase of 12.85% on Mason's figure.

Comparing the IDF value derived in this study with the figure obtained by Kirker is also of interest. Kirker's value was in fact lower than Mason's (by 0.00003) although his method was less scientific.[19] Kirker determined his IDF using a combination of Mason figures and available data at the time. No detailed studies were performed.

The intention of this study was not to produce a replacement figure for future studies but to provide a reference frame with which they can compare. Emphasis is again placed on the fact that this data reflects actual time lost from the classroom - not what time is theoretically budgeted for by training managers under normal circumstances. As advocated by Mason, separate IDF calculations should be made for every administration of the model.

The Updated Mason Model (UMR)

Before presenting the Corporate Factor Analyser, it is necessary to review the model that forms its basis. The following demonstration uses the concept of Mason's original worksheets and represents them as a simplified computer spreadsheet.

Using the same figures as Mason used in his example, the number of instructors for Number Two Technical Training School (2TTS) in 1986 works out to be 26, with one senior instructor. The Updated model presented below also provides for three support staff. This is the same figure as determined by Mason excluding the support staff; something which Mason does not discuss.

[19] Kirker (1993)

Figure 4 **Demonstration of the UMR (Using Mason's original data)**

Course Name	MECH	TECH	AIRENG	AEOP	CTS	ADT	*IDF*
							Military
Max No. of Cses (OLOC)	15	8	3	1	1	3	*0.00076*
Number of Cses (PLOC)	11	6	1.3	1	1	1.5	*Civilian*
Average Course size	25	15	6	4	6	6	*0.00074*
Course Length (weeks)	19.4	30.4	2.1	2.3	35.9	2.5	

Theory	Max Size							Platform Factor
Full Course	50							2
Large Flight	30	489						2
Small Flight	15		735					2
Squad	8			80	90	739.5	96	2
Tutoring	1							4
Practical								
Large Flight	30	244						2
Small Flight	15		370			30		2
Squad	8					390		1.6
One on One	1							2
Assessment								
Theory Exam	30	40	70	4	4	82	3	1.3
Practical Exam	8	4	42			196	3	1.3

Total Periods	777	1217	84	94	1438	102	
Total hours per course	1534	2403	165	185	2524	200	

	PLOC	Instructor Requirements						OLOC
Military								**Military**
Instructors	26	12.8	11.0	0.2	0.1	1.9	0.2	35
Senior Instructors	1	0.6	0.5	0.0	0.0	0.1	0.0	1
Testbank/Support	3	1.3	1.1	0.0	0.0	0.2	0.0	3
Civilian								**Civilian**
Instructors	26	12.5	10.7	0.2	0.1	1.9	0.2	34
Senior Instructors	1	0.6	0.5	0.0	0.0	0.1	0.0	1
Testbank/Support	3	1.2	1.1	0.0	0.0	0.2	0.0	3

Note that Mason did not discuss OLOC numbers for courses because this type of planning is only a recent approach to military strategic management. The OLOC figures offered are hypothetical.

Discussion of the Updated Mason Report (UMR)

The UMR has simplified the teaching categories and, through the use of a computer spreadsheet, made the calculations more accurate (less rounding).

The IDF has been adjusted to a value that better reflects the actual time instructors spend on teaching duties. The IDF for civilians however was estimated in the same way as the IDF is normally derived, ie a best guess using the data available.

The Platform Factors have been taken directly from Mason. As shown in Appendix B, Mason used the value of two for most Platform Factors; the only exception being theory assessment which uses 1.3. With the advent of testbanks[20] and centralised administration units, the duties of RNZAF instructor's have changed significantly. This new model allows for new and different Platform Factors to be entered as required. Although outside the scope of this particular study, it is likely that these values are in need of review and should be validated using current data.

Difficulties with dovetailing and extended downtime between courses remain a problem for theoretical models such as these. In practice, common sense will be needed before applying the results. Increased secondary appointments or cross-employment of staff will at times be necessary.

[20] Testbanks refer to the centralised assessment cell which administers computer generated exams. Previously, instructors were expected to write and administer their own assessments.

The Corporate Factor Analyser

Three demonstrations of the CFA Model are presented in this section.The manipulated variables include: size of course, instructor salaries, and then finally, a combination of number of courses, size of courses, staff development, instructor salaries and supervisor salaries.

Size of Course

The first demonstration of the Corporate Factor Analyser uses the *size of course* as the variable for analysis. Figure 5 shows the graph of the course cost expressed as a per student amount (Equivalent Full Time Student Unit - EFTSU).

Figure 5 Graph Showing EFTSU for Differing Course Sizes

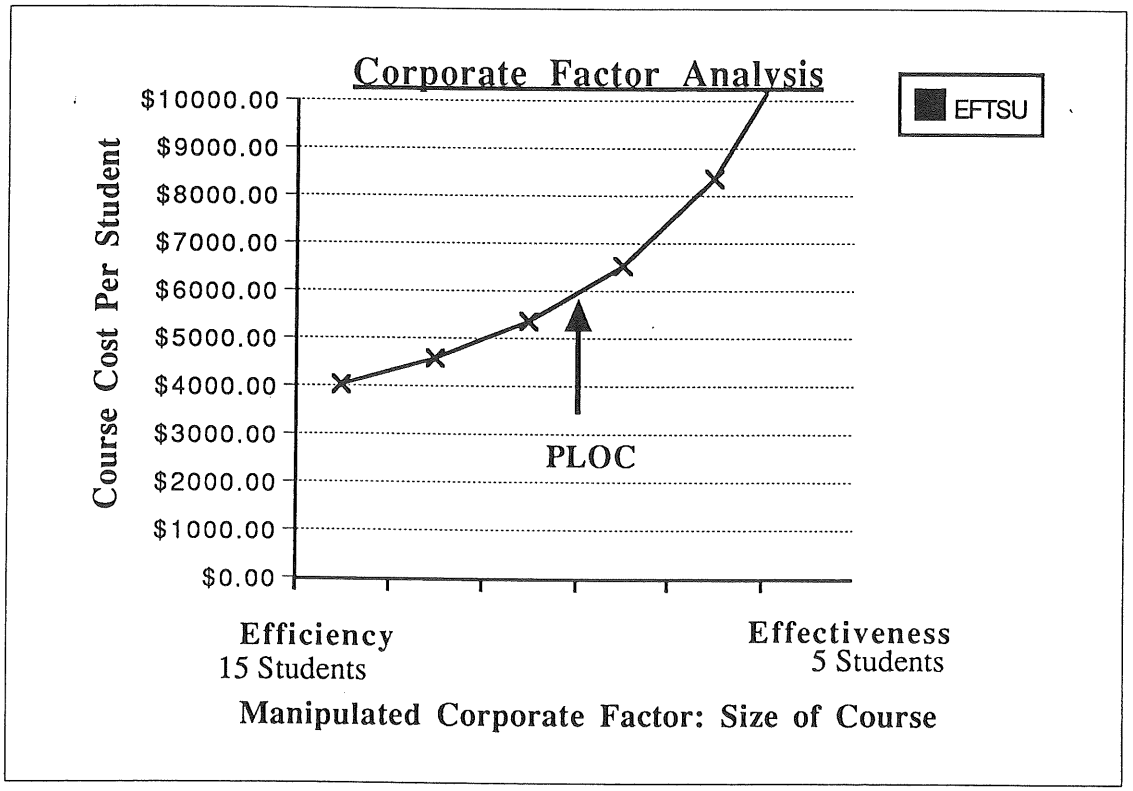


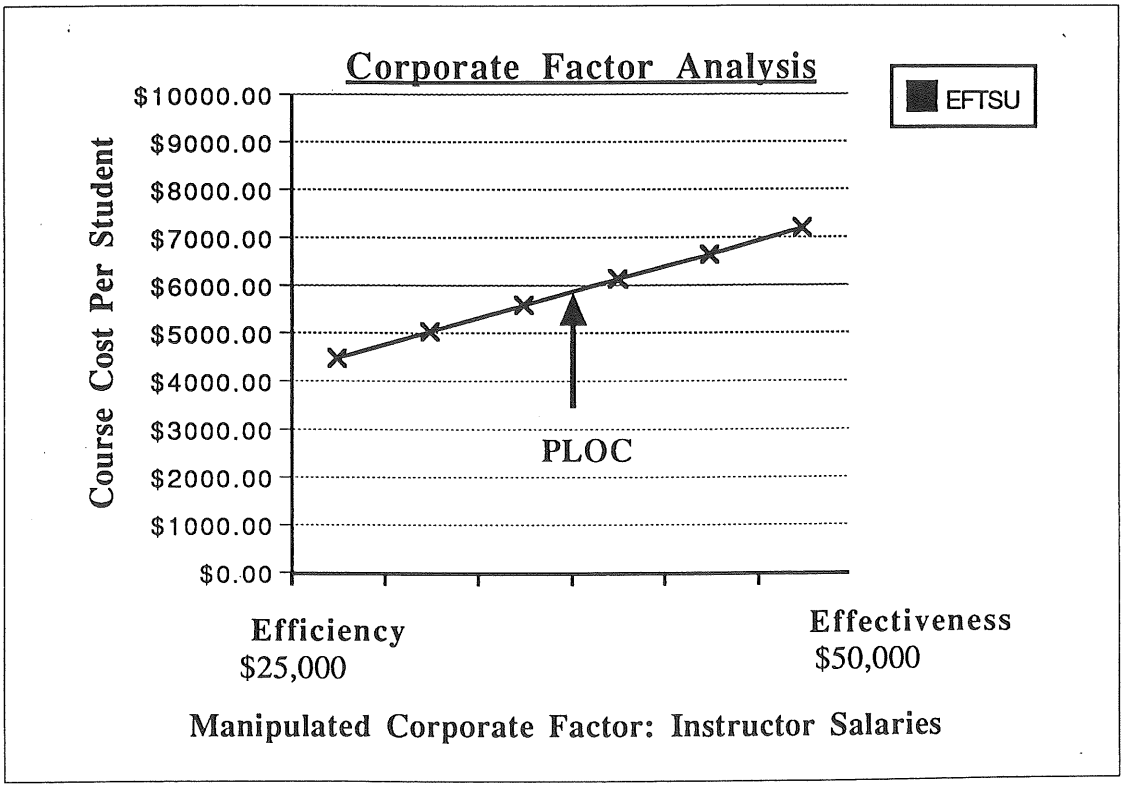
Figure 5 demonstrates very clearly the significant influence a single corporate factor can have on the cost of a course. In this example, the number of students attending the course is manipulated from five through to 15. The table on the CFA shows that the larger course costs only $4,050.38

(*Efficiency*), whereas the smaller course (*Effectiveness*) costs $11,717.69 per Equivalent Full Time Student (EFTS). The graph shows how the cost of the course increases significantly when the size drops below the current average (PLOC) of 10. This analysis is indirectly manipulating the staff student ratio, which in turn, has an impact on the quality of instruction. Smaller ratios would normally indicate a better quality of instruction, although in some cases, courses that are too small lack vital student interaction. Although this model can identify the cost of the course, subjective decisions are still required as to what that optimum class size is for quality of learning.

Instructor Salaries

To demonstrate the effect of differing pay scales for the course instructors, the following demonstration is provided. Figure 6 shows the CFA graph when the instructor salaries are manipulated.

Figure 6 Graph Showing EFTSU for Differing Instructor Salaries



At *Efficiency* the instructors are paid only $25,000; this results in a real cost per student of $4,496.87. When the instructors' salary is averaged at $50,000 (*Effectiveness*) the course costs $7,235.13 per EFTS. In real terms, this equates to using either junior, inexperienced Pilot Officers as instructors or conversely more experienced Squadron Leader instructors. The obvious tradeoff being the quality of the instructor/tuition. When a training manager considers reducing the establishment rank level they will now be able to realise that even greater savings can be made simply by ensuring that the size of the course is maintained to a higher level. This may include importing more foreign students or reducing the number of courses per year and redeploying the staff to other duties.

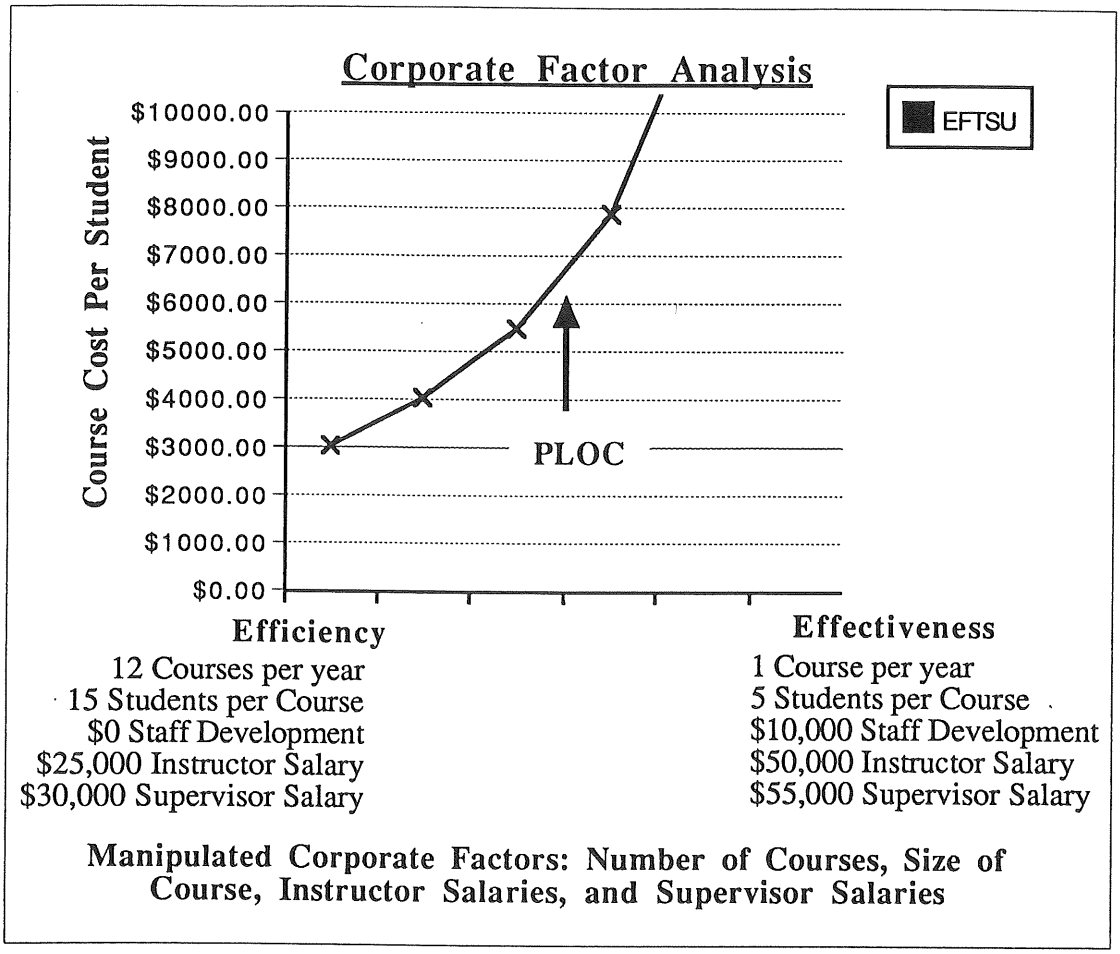
This type of information, which was previously unavailable to training managers, can now be quickly and easily derived for efficient management of personnel and resources.

Multiple Manipulations

The final demonstration of the CFA shows the effect of manipulating multiple corporate factors simultaneously. The cost per student for the course changed from $3,030.32 at *Efficiency* through to $32,260.42 at *Effectiveness*, when the following variables were selected: size of course, number of courses, instructor salaries, supervisor salary, and staff development.

This example demonstrates the extreme conditions with which the model can cope. Normally the model would not be used for more than two simultaneous manipulations because the results become less accurate with too many unknowns. When multiple corporate factors are selected, the arrow indicating PLOC becomes irrelevant.

Figure 7 **Graph Showing EFTSU for Multiple Corporate Factors**



Discussion on the Corporate Factor Analyser

The model has been demonstrated under several configurations. In each case the cost of the course has been shown to change considerably. Senior managers who are responsible for the long term planning and budgeting can now manipulate selected corporate factors and instantly see the effect on the cost of the course. Although useful for determining the optimum cost configuration and for comparing the relative influence of different corporate factors, the model still does not provide cost-benefit data. Such information would only be available when the various costs are married up with additional data about the value of different corporate factors on the learning process. Future developments of the model will hopefully combine this information to produce cost-benefit analyses.

Currently the model is in its infancy and requires further development. The nature of training and education means that an analysis tool needs to be as dynamic as the methods it is assessing. As with the updated Mason model, the Corporate Factor Analyser is not sufficient for blind operation. Common sense is needed for certain conditions and logical decisions will not come from theoretical models alone.

In addition to these problems, a certain number of assumptions have had to be made in the development of the model. The following points should be noted about the Corporate Factor Analyser:

1. The Ministry of Education provide three different categories for course factors.[21] The first refers to courses of one or more full time full academic years. The second refers to full-time programmes of two or more weeks. In both of these examples however, a student week is considered to be 20 hours, whereas for the RNZAF, a student week is 38 hours. To allow for this irregularity, the third category (Group C) was used in the CFA. This final category allows for calculations to be made based on an hourly rate. The student hour is considered to represent 0.0015 EFTS (Equivalent Full Time Students).

2. The following expenses are currently omitted from the model as they are perceived to have no bearing on the quality of training:

    a. Student travel costs pre or post course
    b. Personal (student) stationery costs and clothing expenses
    c. Student salaries
    d. Accommodation and Rations (including morning and afternoon tea)

Arguably these aspects could have a bearing on the quality of training, in particular the aspect of external motivation on the students. Future developments of the model may wish to include the above expenses and manipulate them as corporate factors.

---

[21] A course factor is the proportion of 1.0 EFTS unit that the course is deemed to represent of a normal year's work for a full time student. Ministry of Education (1992) page 12

3. When the CFA is used to indicate civilian instructors (in the RNZAF), the model changes the Instructor Diversion Factor (IDF) from the previously calculated military one to the alternate civilian figure. This civilian IDF has less time allocated to unit duties and no sport allocation. Although policy differences exist between civilian and military instructors the reality may be different from what is thought. A detailed workload survey, similar to the diary used in this study, may be necessary. Adjustments will also be needed for the PLOC instructor salaries value.

4. The values for the support staff and supervisors have been approximated and are in need of a validation study. The values chosen were rounded to 1:10 and 1:20 respectively. The value for the dedicated supervisor is the same as Mason's (1:20) but no mention was made of support staff in his original model. Like most parts of that document, Mason does not provide a reference for the figures used. It is possible that the values he chose were as a result of extensive research although unless this can be verified, validation studies should be conducted. The value chosen for support staff in this model reflects an approximate ratio of the support staff to instructors within Ground Training Wing[22] as at June 1996.

[22] Ground Training Wing is the main training provider within the RNZAF.

Chapter 5

Conclusions

5.1 Summary of Findings

Self selection

The findings from this study indicate that the RNZAF recruits personnel who already have similar levels of military attitudes to those who are currently serving. The comparison of new recruits with serving personnel showed no significant difference in their Military Ethos Scale scores. This finding is consistent with both the Cokerham[1] study and the Bachman et al.[2] study.

The implications of this finding suggest that the RNZAF should continue to take great care with whom it recruits. Recruiting procedures, target audiences and advertising themes should be carefully reviewed to ensure that the right type of personnel enter the RNZAF. The wording of recruiting material should be monitored to ensure that the military is not only portrayed as a job but also as a career.

The gender analysis showed there is no significant difference between males and females when they first join up but this similarity does not exist with the longer serving cohort . The serving males scored significantly higher ($p=0.0012$) than their female colleagues on the MES instrument. This result was not found with the 'less than 10 years service' comparison however. These findings could indicate that female pro military attitudes decrease over time. It is also possible that this finding indicate a difference with an older age group. But because the difference between the average ages of the two groups was less than 10 years, this theory seems less likely. A longitudinal, rather than cross sectional, study would be necessary to validate this claim however. A third possibility could be that pro military females leave earlier than those who are less positive toward the RNZAF. This final possibility also seems unlikely.

---

[1] Cockerham (1978)

[2] Bachman, Sigelman, and Diamond (1987)

Inculcation

The results suggest that most RNZAF ground courses do not significantly increase student attitudes in terms of scope or primacy. Only one course (R2/95 Initial Basic Military Training course) showed widespread increases in Military Ethos Scale scores. These results reflect the findings of previous research.[3] The fact that only a few courses caused students to significantly decrease their attitudes of loyalty, and that most at least retained the status quo, is perhaps some consolation. It is possible that greater exposure to civilian procedures and attitudes, by attending civilian courses, could be detrimental to the military culture. This possibility is worthy of investigation through future studies.

The Updated Mason Model

In developing this model, the thesis has conducted a number of sub studies. These provided recent data necessary for calculating the Instructor Diversion Factor. Two interesting findings were made in this part of the study. Firstly, instructors appear to spend a great deal more time on unit duties than was previously thought and secondly, civilian instructors don't appear to be much more efficient than their uniformed equivalent. While they don't attend parades nor are they supposed to take sport, they are not required to work the same number of hours per week. Often when the uniformed students are required to attend the parades, the civilian instructors find themselves rostered with a free period. With their shortened number of hours worked per week, the difference between civilian and uniformed instructors comes down to their difference in pay (including free dental, medical and reduced rate housing). Depending on the individual case, it is possible that civilian instructors may actually cost more than uniformed ones.

The updated Mason model represents a fairly major change to the appearance and method of calculating staffing levels in RNZAF training providers. By simplifying the approach and by turning the model into an electronic spreadsheet, the new version is intended to be more accessible to the average training manager than was previously possible.

Future developments of the model should allow for larger and more complicated functions to be performed. For example, strategic planning of instructor requirements can be determined by

[3] Brewer (1975), Priest et al. (1982), Stevens et al. (1994)

connecting this model to other models which project the long term staffing levels of the entire RNZAF. By entering the required levels for the RNZAF, along with estimated recruiting and resignation figures, RNZAF management can determine the number of future courses required and therefore the associated instructor requirements. Other developments will include an automatic calculation of post graduate and senior courses based on the number of primary level ones.

The ease with which the model can be used to determine operational requirements (OLOC) is also obvious. As a management tool, the Mason model can project a range of hypothetical scenarios. Added to this capability, the model can be used to measure the current staffing efficiencies. By entering the current operating levels with the minimum required, a manager can see if the unit is under or over strength and by how much.

Another future development of the model will be to extend it to include larger units or to combine multiple training providers. This could be coupled with another development to account for dovetailing courses and maximising the efficiency of shared resources and instructors.

The Corporate Factor Analyser

The model is still in its infancy and will be refined through further exposure to the RNZAF. As it was presented, it provides the information that it was designed for although more accurate data will be obtained if a larger number of intervals are set. The model is also hindered by the fact that there are many assumptions[4] made with figures and values. In the absence of formal policy and guidance, it was necessary to make such assumptions but future studies and/or policy from Air Command will help to reduce the inherent errors in the model.

Currently the model only provides for the analysis of a single course. To be useful in optimising all resources and corporate factors, the model must be used on all courses offered by a training provider. This will help allow for multitasking of instructors and sharing of resources.

[4] These assumptions include aspects such as platform factors, ratios for support staff in terms of instructor numbers, and the expected workload of civilian instructors.

5.2 Limitations of the Study

The biggest limitation of this study is the assumption that the Military Ethos Scale is a valid measure of the 'Military Factor.' As was discussed in Chapter Two, the military factor is a complex and difficult phenomenon. It encompasses a variety of cultural attitudes and values.

The traditional military character values of integrity, personal discipline, and professionalism are still important to the RNZAF. The influence of RNZAF training on these values was not measured in this study. These factors, and others like the immersion into RNZAF workplace type environments and exposure to role model instructors are however, difficult aspects to measure.

Based on Moskos' I/O theory, attitudes of primacy and scope reflect a service person's loyalty value which in turn is one of the strongest indicators of institutionalism. While acknowledging that loyalty is not the only component of the military factor, it did provide a manageable scale on which students could be measured.

Cotton obtained a Cronbach coefficient alpha of 0.78 for his Military Ethos Scale, which suggested that it was a reliable instrument. The application of it as a pre and post measure for short courses (less than one year) however, may not be appropriate. The various results from this study indicate that significant differences were obtainable from the instrument.

With only six questions and the context in which the instrument was administered to the experimental group, subjects may have responded in terms of how they think they should rather than honestly.

It is also necessary to acknowledge that military values cannot be expected to increase continuously. Given the social and political climate in which the RNZAF operates, there is likely to be a level of pro-military attitudes above which no amount of training will make any difference. This 'absolute level' could perhaps be identified and then used by the RNZAF as a reference for its 'acceptable level' of military attitudes to be measured against. The fact that the RNZAF has not articulated such guidelines is not surprising given the dynamic nature of the military culture.

Another limitation of this study involves the sample size for the control groups. Larger sample sizes are always desirable and future studies could certainly increase the selection. Of greater importance however, would be the better representation of personnel from trades and bases. Although Collyer[5] found no difference between combat and support trades in the Australian Army, other studies[6] have indicated that such differences do exist. A more representative control group would pay greater attention to personnel serving on both support and operational bases.

In the case of the data collected for the updated Mason Model, much of the workload survey is in need of review as it predated the creation of many Ground Training Wing cells. For example, instructors are no longer required to conduct all their own training development and much of their administrative duties have been taken from them also. At the time of writing this report however, the transition between the old and new methods was not complete. A review of instructor establishments in Ground Training Wing is due to be undertaken soon. Care also needs to be given that the data obtained from Ground Training Wing is not used as the only reference. The Mason Model, and the Corporate Factor Analyser, is intended to be used in all ground training units within the RNZAF.

No comparisons were made for residential courses as opposed to non-residential. The only course within this study that was not entirely residential was the JOEC and even then, only a few students were local.

This study has taken a slice of the RNZAF's training system for the analysis. While theoretical studies can provide guidance for future planning, care needs to be taken such that the results are kept in context with the bigger picture. No compensation has been allowed for the provision of instructors to support an operational unit's OLOC[7] responsibilities. Although outside the scope of this study, in terms of identifying the military factor, such a consideration should be included in the event of civilianising military training.

---

[5] Collyer (1995).

[6] Cotton (1981) and Wood (1980).

[7] Operational Level Of Capability - The RNZAF's training providers act as a pool of qualified personnel on standby in the event of an operational unit deployment.

5.3 Conclusions

This study has shown that RNZAF courses have minimal effect on increasing student's promilitary attitudes but the organisation does self select personnel who already hold traditional military values. The RNZAF's courses do however, operate with different management philosophies than most civilian training providers. The aspects that separate military and civilian training methods have been labelled corporate factors. It is argued that: by optimising these corporate factors, and decreasing inefficiencies, the RNZAF can ensure long term savings in both human and material resources. Optimising these corporate factors is now possible through the CFA model, which was developed as part of this study. Further developments of this model will enable the RNZAF to maximise both the efficiency and effectiveness of its formal training courses.

References

Alpas, F. (1994) *The Effects of Organisational Change in the Military: A Comparison of Work Related Perceptions in Military and Non-Military Environments.* An unpublished doctoral dissertation. Massey University.

Arvey, R.D., Maxwell, S.E. and Salas, E. (1992) The Relative Power of Training Evaluation Designs Under Different Cost Configurations. *Journal Of Applied Psychology* Vol. 77, No. 2, p 155-160.

Ashenfelter, O. and Card, D. (1985) Using the Longitudinal Structure of Earnings to Estimate the Effect of Training Programs. *The Review of Economics and Statistics.* p 648-660.

Astin, A.A. (1977) *Four Critical Years.* San Francisco, CA: Jossey-Bass

Bachman, J.G. Sigelman, L. and Diamond, G. (1987) Self-Selection, Socialisation, And Distinctive Military Values: Attitudes of High School Seniors. *Armed Forces and Society,* v13 No. 2, Winter, p169-187.

Barnes, W.J. (1994) *Brief for Treasury Officials on The Need For In-house Ground Training, 10 May 1994.* An unpublished presentation.

Beale, K. (1995) *Infrastructure of the New Zealand Defence Force.* Unpublished thesis, University of Waikato.

Bishop, J.H. (1989) Toward more Valid Evaluations of Training Programs Serving the Disadvantaged. *Journal of Policy Analysis and Management,* Vol.8, No.2, 209-228.

Brewer, I.L. (1975) The Impact of Advanced Education for American Military Officers: The Case of Arms Control Perspectives. *Armed Forces and Society* Vol 2 (Fall) p 63-80.

Bruhns, C.C.P. (1991) *A Description of the New Zealand Defence Force in Comparison with Other New Zealand Organisations.* Defence Psychology Unit Research Report 2/91.

Cockerham, W.C. (1978) Self-Selection and Career Orientations Among Enlisted US Army Paratroopers: A Research Note. *Journal of Political and Military Sociology* 6 (Fall): pp 249-259

Collyer, R. (1995) *Moskos in Australia* Unpublished dissertation. Division of Health and Behavioural Sciences. Griffith University, Nathan, Queensland, Australia.

Cotton, C.A. (1981) Institutional and Occupational Values in Canada's Army. *Armed Forces and Society,* v8 No 1 p99-110.

Department of Defence (1992) *Australian Defence Force Academy: Program Evaluation,* Inspector General Division. Canberra.

Gabriel, R.A. (1980) To Serve With Honour. *Army* V30 (5) p 17-21.

Huntington, S.P. (1957) *The Soldier and the State.* Cambridge, Mass.: Harvard University Press.

Janowitz, M. (1977) From Institutionalism to Occupationalism - The Need for Conceptual Continuity. *Armed Forces and Society,* v4 No 1 p51-4.

Jans, N.A. (1989) Military Professionalism: Changes in the Australian Defence Force. *Armed Forces and Society,* v15 No 2, Winter, p171-191.

Kathwohl, D.R., Bloom, B.S. and Masia, B.B. (1964) *Taxonomy of Educational Objectives, Handbook II: The Affective Domain.* New York: D.McKay.

Kirker, P. (1993). *Establishment Review for Number Four Technical Training School as part of Project Recast.* RNZAF Base Woodbourne File: Project Recast.

LaLonde, R.J. (1986) Evaluating the Econometric Evaluations of Training Programs with Experimental Data. *The American Economic Review.* Vol. 76. No. 4. p 604-619.

Maginnis, R.L. (1993) A Chasm of Values. *Military Review*, February.

Maruna, D.C. (1994) Duty, Honor and the Commission. *Proceedings*, June.

Mason, P. (1986) *Assessment of Instructional Posts at RNZAF Ground Training Establishments*, RNZAF SGHQ 1920/20, 4 October.

McCloy, T.M. and Clover, W.H. (1989) in Moskos, C.C. Jr. and Wood F.R.(Eds) (1989) *The Military: More Than Just a Job?* Pergamon Brassey's, USA.

McKenna, K.J. (1993) *Back To The Future: The Utility of Traditional Military Values in the Changing Royal New Zealand Air Force.* An unpublished Commandants Paper. Command and Staff College. RNZAF Base Auckland.

Ministry of Defence (1994) *Audit of RNZAF Base Woodbourne: Report No. 83.* Audit and Assessment, Wellington.

Ministry of Education (1994) *Funding Growth In Tertiary Education and Training: Report of the Ministerial Consultative Group*, Wellington.

Ministry Of Education (1992) *The EFTS (Equivalent Full-Time Student) Funding System for Tertiary Institutions 1995.* The Ministry of Education.

Moskos, C.C. Jr. (1977) From Institutionalism to Occupationalism - Trends in Military Organizationalism. *Armed Forces and Society,* v4 No 1 p41-50.

Moskos, C.C. Jr. (1986) Institutional/Occupational Trends in Armed Forces: an Update. *Armed Forces and Society,* v12 No 3, Spring, p377-82.

Moskos, C.C. Jr. and Wood F.R. (1989) *The Military: More Than Just a Job?* Pergamon Brassey's, USA.

NZAP 701 Strategic Plan (1995) RNZAF Public Relations Office. Wellington.

Popham, W.J. (1993) *Educational Evaluation*, 3rd ed. Allyn & Bacon, MA.

Priest, R., Fullerton, T. and Bridges, C. (1982) Personality and Value Changes in West Point Cadets. *Armed Forces and Society*, v8 p629-42.

Segal, D.R., Blair, J.D., Lengermann, J., and Thompson, R. (1983) Institutional and Occupational Values in the United States Military. *in* M.D. Mariotta, J. Brown and M.J. Collins, eds, *Changing U.S. Military Manpower Realities*. Boulder, Colo.Westview Press,107-27

Segal, D.R. (1986a) Measuring the Institutional/Occupational Change Thesis. *Armed Forces and Society*. Vol. 12, No. 3, Spring, 351-76.

Segal, M.W. (1986b) The Military and the Family As Greedy Institutions. *Armed Forces and Society*. Vol. 13, No. 1, Fall, 9-38.

Soble, R. (1977) Student Value Change and Congruency with Faculty Value Change in Professional Education Related to Reference Group Theory. *Dissertation Abstracts International* 37 II-A:7346

Sørensen, H. (1994) New Perspectives on the Military Profession: The I/O Model and Esprit de Corps Reevaluated. *Armed Forces and Society,* v20, No 4, Summer, p599-617.

Stahl, M.J., Manley, T.R. and McNichols, C.W. (1978) Operationalizing the Moskos Institution-Occupation Model: An application of Gouldner's Cosmopolitan-Local Research. *Journal of Applied Psychology*, Vol 63, No 4, 422-427.

Stahl, M.J., McNichols, C.W. and Manley, T.R (1980) A Longitudinal Test of the Moskos Institutional-Occupational Model: A Three Year Increase in Occupational Scores. *Journal of Political and Military Sociology* 9. pp 43-47.

Stevens, G, Rose, F.M., and Gardner, S. (1994) Military Academies as Instruments of Value Change. *Armed Forces and Society*, v20 p473-84, Spring.

Wood, F.R. (1980) Air Force Junior Officers: Changing Prestige and Civilianization. *Armed Forces and Society,* Vol. 6, Spring, 483-506.

Glossary

This Appendix provides a simplified explanation of military abbreviations used in the thesis.

2TTS Number Two Technical Training School. Formerly of RNZAF Base Wigram, now relocated to Woodbourne.

4TTS Number Four Technical Training School. Renamed as part of Project Recast to Aeronautical Training Flight (ATF), now part of Ground Training Wing at Woodbourne.

ABB Activity Based Budgeting. A budgeting system employed by the RNZAF to monitor costs.

ADF Australian Defence Force.

ADFA Australian Defence Force Academy. - A tertiary level institute run by the ADF

AFCDT Airforce Cadet. The title (rank) of students while on recruit course.

AIR-Q Air Force Quality. - The RNZAFs version of Total Quality Management (TQM)

AITC Aircrew Instructional Techniques Course taught at RNZAF Base Woodbourne.

ATF Aeronautical Training Flight *see* 4TTS

BASIC see BENG

BENG Basic Engineering. The primary trade course undertaken by all aircraft and avionic mechanics immediately after the IBMT. Sometimes referred to as simply BASIC

CAS Chief of Air Staff. The most senior officer in the RNZAF.

CDF Chief of Defence Force. The officer in charge of all three services.

CO Commanding Officer. An Officer who is in charge of a Wing or an operational squadron.

CPA Confidential Personal Appraisal. An annual reporting system used in the RNZAF.

CPL Corporal. Collectively referred to as JNCOs as they are the most junior NCO rank

DNCO Duty NCO. A secondary appointment that all NCOs on a base are rostered to perform.

EFTS Equivalent Full Time Student. A calculation used for funding by MOE. Also used in performance indicators for training establishments.

EFTSU Equivalent Full Time Student Unit. The cost of a course per EFTS

FTE Full Time Equivalent. A calculation similar to EFTS used to represent the number of instructors/tutors at a training establishment

GSI General Service Instructor. The instructors who train recruits.

GSTS General Service Training Squadron. The unit which conducts recruit training.

GTW Ground Training Wing. The collective organisation which encompasses all ground training schools. Located at Woodbourne.

IBMT Initial Basic Military Training Course. The first course undertaken by new recruits upon enlistment into the RNZAF.

I/O Institutionalism/Occupationalism. A continuum developed by Moskos (1977) to measure military attitudes.

IOTC Initial Officer Training Course. The course undertaken by all new officers in the RNZAF. The course is conducted by CTS.

JOEC Junior Officers Executive Course. A course held for officers who have approximately four or more years service.

MES Military Ethos Scale. An instrument developed by Cotton (1981) to measure attitudes of primacy and scope in military personnel.

MLOC Minimum Level Of Capability. The minimum state of preparedness of a unit.

MNE Manpower Non Effective. A term used to describe students while on course

MOD Ministry of Defence

MOE Ministry of Education

MRU Manpower Required in Uniform. A study looking at the number of uniformed or civilian personnel required by a unit for differing levels of OLOC.

NCO Non Commissioned Officer. The supervisor level of the RNZAF. Consists of three ranks: Corporal, Sergeant and Flight Sergeant.

NZAP 300 The RNZAF's manual of leadership.

NZAP 701 The RNZAF's Strategic Plan. Released every financial year.

NZDF New Zealand Defence Force. The NZ Army, the RNZN and the RNZAF.

OC Officer Commanding.The officer who is in charge of a squadron or school.

OCDT Officer Cadet. A student on the Initial Officer Training Course

OJT On the Job Training

OLOC Operational Level Of Capability. Units have various OLOC states which are based on different size and types of taskings. Using these scenarios units can determine resource requirements to perform the duties specified

ORs Other Ranks. This is a term used to describe personnel other than commissioned officers

PLOC Present Level Of Capability. Similar to MLOC and OLOC but refers to the current state of that unit.

PTI Physical Training Instructor.

RAF Royal Air Force

RAAF Royal Australian Air Force

RNZAF Royal New Zealand Air Force

SGHQ Support Group Headquarters. Prior to Project Recast, this was the Group within the RNZAF that was responsible for training.

SGT Sergeant.

SNCO Senior Non Commissioned Officer. Collective term used to describe SGTs and F/SGTS.

SQN. Squadron. A unit (operational or support) with approx. 30 - 100 personnel.

TQM Total Quality Management. A civilian management system which has been adapted by the RNZAF and renamed Air-Q.

USAF United States Air Force

USAFA United States Air Force Academy. A tertiary institute administered by the USAF.

W/O Warrant Officer. The most senior rank below a commissioned officer.

The Mason Model

The Mason model, as it is now known, was developed by Squadron Leader Peter Mason when he held the RNZAF position of Staff Officer Training Standards in 1986. In his introduction to the model he describes the hit and miss techniques that had previously been employed to derive establishment numbers for instructors and outlined the need for a more scientific approach. While his model has been accepted and used by the RNZAF for the past ten years, there is now an opportunity to simplify it down so that more people can use it.

The model is reasonably sound in its approach and it appears to have been based on various similar models used elsewhere, both within New Zealand and overseas. To use the model manually, it is necessary for a user to understand the concept and philosophies behind its operation. Although the report provides a reasonable explanation of its terminology and how to use the model, it is still difficult to understand. While electronic spreadsheets were certainly available in 1986 they were not as prolific as they are today. With computers appearing on every desk of middle and senior management in the RNZAF it is now possible to provide them with a management tool that can be quickly learned and used.

This appendix provides a brief synopsis of Mason's original model; including an explanation of terms and a sample calculation.

Brief Overview

The model takes the number of periods required to teach a course and multiplies each one by a preparation-performance factor (called the platform factor). This allows for the differing amounts of preparation required for different types of instructional methods, for example: showing a video as opposed to taking a field trip. Having calculated the number of instructor hours necessary to administer the course and then multiplying that figure by the number of times that course is run per year, a total number of hours per year is obtained. From here, a calculation is made to compute the number of instructors required for that system (or repetitions of that course in a year).

To determine how many instructing and preparation hours represent a full time instructor, another separate calculation is necessary. By first determining the maximum number of instructional hours available in the year, various distracting activities can be subtracted. These activities which impinge on the primary duties of an instructor include things like leave, sport, unit meetings and secondary appointments. The model subtracts each of these activities off the total number of work hours available in the year and reciprocates it to obtain what is called the Instructor Diversion Factor or IDF. By presenting it as a reciprocal, Mason was then able to multiply it by the number of instructor hours required for each system. This figure showed the number of instructors, or part of a full time instructor, that is required to prepare and instruct that system. This same procedure is then repeated for every course offered by the particular training provider. By adding up all of these system instructor numbers, the total number of instructors for that unit can be obtained. Mason then offered a table for calculating the number of supervisors (called senior instructors or SIs) required.

Terminology

The platform factor, as discussed above, is derived from a series of other figures. Mason uses Maximum Platform Hours (PHr) and Ratio of Platform-to-Preparation Time (PT) in the explanation of how he derived the Platform-Preparation Factor (PF), however only the latter, actually appears in the calculations of the model. These are all explained further:

Maximum Platform Hours (PHr)

> A reasonable workload is essential if an instructor is to be effective. The average number of hours per week for which an instructor is available for classroom work is defined as the maximum PHrs. It is not uncommon to hear of the PHr being referred to as 'class contact time.' Although it may be possible to schedule an instructor for eight consecutive hours on instruction, the quality of his [or her] performance is certain to deteriorate as the day progresses. In addition, to be effective, instructors must be well prepared. Time must be allocated for preparation. For these reasons, instructor workload during a single

day and a single week must be limited. Since certain types of instruction are more demanding both in terms of lesson preparation and delivery, different maximums must be set for each strategy.

Despite Mason's own analogy of platform time being 'class contact' he also includes a multitude of preparation type duties under the same heading:

On the job training of new instructors	Cross training
Equipment preparation	Lecture notes
Blackboard summaries	Marking & recording of tests and examinations
Up dating teaching materials	Student assessment reports
Recovery of training failures	Setting up instructional equipment
Laboratory development	Routine instructor guide maintenance
Minor syllabus revision	Setting and marking of homework
Maintenance and issue of publications	Technical control of subject areas
Minor maintenance of instructional equipment	Student interviews
Assisting in internal validation	Initiation of training aids
Maintenance of technical inventories	Question banks and examination support

Ratio of Platform-to-Preparation Time (PT)

Different instructional strategies require varying amounts of preparation time. It should be evident that the original lesson or learning exercise requires considerably more preparation time than subsequent repetitions of the same lesson. The complexity of content, the availability of reference materials, and the amount of research required are variables which necessitate upward adjustments in the preparation time allowed.

Mason provides a table of suggested Platform-to-Preparation time ratios. His table includes a variety of teaching techniques including: team teaching, team learning, closed circuit television and computer based instruction. Some of the more common teaching styles that he offered are listed below.

Table B1 Limits and Factors for Methods of Instruction

	Platform hours		Platform to Preparation			Instructor - Trainee
	Daily (Max)	Weekly (Max)	Initial (Min)	Succeeding (Max)	Platform Factors	Ratio (Max)
Lecture	4	20	1:24	1:1	2	1:50
Theory lesson	4	20	1:24	1:1	2	1:12
Discussion	4	20	1:24	1:1	2	1:8
Demonstration	4	20	1:24	1:1	2	1:12
Theory Exam	6	24	3:1	3:1	1.3	1:30
Practical Exam	4	16	1:2	3:1	2	1:6

Platform-Preparation Factor (PF)

This factor represents the relationship between the number of hours an instructor can teach a specified block on instruction per day, and the total number of teaching hours available per day. If it is determined that due to the complexity of the instructional material, an instructor can only teach four hours per day and there are eight hours available, the platform factor of 8 is divided by 4, i.e. 2. In determining the platform-preparation factor, the following items must be considered:

(1) The complexity of the material to be presented
(2) The complexity of the material to be learned
(3) The availability of reference material
(4) The strategy employed
(5) The amount of research and new learning required

As can be seen from the table, the majority of the platform factors were presented as two. The only exception, of the ones shown, was the theory exam which was 1.3. All of these figures have been used for the standard platform factors in the Corporate Factor Analyser. Because the platform factor can make a big difference to the number of instructors required, it in turn must make a big difference to the cost of the training. For this reason, the platform factor has been considered as a corporate factor and can therefore be manipulated in the CFA.

Instructor-to-Trainee Ratio

The number of trainees that can be handled adequately by one instructor depends mainly on the strategy employed. At times however, the content, particularly that which deals primarily with the development of manipulative and team skills, dictates larger instructor-trainee ratios. Other factors, such as limitations of content, room size, equipment, and the like, may necessitate fewer trainees per instructor than would otherwise be the case.

Programme of Instruction (POI)

This refers to the number of periods detailed in the manual of training for each different teaching method used i.e. lecture, lesson, demonstration etc.

Instructor Factor

This factor represents the average number of instructor hours required to teach each hour of the POI in each primary method of instruction. The POI hours are separated according to the instructional strategy prescribed in the manual of training. In determining the number of instructors needed, the following items must be considered: the number of trainees in a class; the number of training positions (seating and equipment) available in the classroom, or laboratory, the physical layout of the training facility; safety requirements; course content, particularly that which deals with manipulative and team skills; and any other special or limiting factors.

The following is a sample calculation of an Instructor Factor based on a 368 hour programme of theory, practical, films and examinations:

Instructor Factor

Total hours in the programme of instruction (POI) : 368

Total theory lesson hours	130
Total practical lesson hours	198
Total examination and film hours	40

Theory Lesson : 130

113	x	1	instructor hours	=	113.0 hours
17	x	3	instructor hours	=	51.0 hours
					164.0 hours

164 / 130 = 1.26 Instructor Factor

Practical Lesson : 198

20	x	3	instructor hours	=	60.0 hours
178	x	5	instructor hours	=	890.0 hours
					950.0 hours

950 / 198 = 4.80 Instructor Factor

Examination and Training Films : 40

2	x	1	instructor hours	=	2.0 hours
13	x	2	instructor hours	=	26.0 hours
25	x	3	instructor hours	=	75.0 hours
					103.0 hours

103 / 40 = 2.58 Instructor Factor

Instructor Diversion Factor (IDF) *(also referred to as the Constant Diversion Factor)*

A diversion allowance needs to be added to the number of instructors produced from basic calculations. This allows for non teaching diversions which impinge on the instructor's working time eg leave, sickness, supervision, detachments, courses and various service duty absences which are normally taken into account in the calculation of an establishment.

There are three steps to calculating the IDF:

Step One	List the number of working hours per year	(2080 hours)
Step Two	Subtract the total number of official hours of absence from 2080 (These include leave, parades, sport, visits, stand downs.)	
Step Three	Calculate the reciprocal of the balance at step two	

Mason notes that where a school does not utilise an instructor for all-year teaching then the IDF value needs to be adjusted proportionally for only the time that the instructor is engaged in teaching a course. If an activity that should be counted in the IDF falls entirely outside the period of instruction then it should not be included in the calculations at all.

A sample calculation of the IDF:

Total possible individual platform hours /year
(40 per week @ 52 weeks per year) = 2080

Subtract the following average individual platform hours per year:

(1) Leave per individual in hours (AL,LSL,STAT)	=	311.25
(2) External courses	=	58
(3) Sick and Dental	=	34
(4) Service duties (other than instructional)	=	96
(5) Sports (weekly and representative)	=	101.1
(6) Aids to civil community and formal visits	=	12.6
(7) Compassionate (Births, Deaths etc)	=	2.18
(8) Married quarters and house purchase	=	10
		625.13

The balance of 1454.87 periods/hours per year represents the recommended factorized individual maximum hours/periods per year. The reciprocal is the Instructor [Diversion] Factor.

= 0.000697

The accuracy of these figures in today's environment is questionable. Many aspects of an instructor's workload have changed over the years, as have the RNZAF's policies on sport, leave and in some cases, external courses.

Supervision Requirement

> Supervision posts need to be established on a percentage basis in addition to the number of instructor posts. Where this results in a part of a post an appropriate part of the instructor load is to be given to the supervisor. All senior instructors are to be qualified instructors and instructor prerequisites should be annotated accordingly.

Mason offers the following table for determining the establishment of supervisors (known as senior instructors or SIs).

Table B2 Senior Instructor Requirements

Number of Instructors	Under 2	Under 5	Under 10	Under 15	Under 20	Under 23
Number of Senior Instructors (SIs)	0	1	1	1	1	1
SI Teaching Load	-	0.75	0.6	0.5	0.25	Nil
SI Rank	-	Sgt or F/S	F/S	F/S	F/S	F/S

The table continues for a larger number of instructors simply by subtracting 20 from the instructor number and recalculating for the remainder. For example, 30 instructors would require 2 Flight Sergeant Senior Instructors with either one having a 50% teaching load or them both having a 0.25 load. The rank of the SI for less than 5 instructors depends on the rank of the instructors being supervised.

Definition of hours

Mason explains that in his model, one hour is synonymous with one period. He argues that a normal period of instruction includes 50 minutes in the classroom and 10 minutes of relocation, personal tutorials and rest. When a training provider works on a significantly different schedule for its teaching periods then an adjustment needs to be made to the model to compensate.

Rules for Rounding

Mason offers the following table for rounding off instructor numbers.

Table B3 Rounding Table for Instructor Numbers

Greater than	Converts to
0.100	1
1.077	2
2.154	3
3.231	4
4.308	5
5.385	6
6.462	7
7.539	8
8.616	9
9.683	10
10.770	11
11.847	12
12.924	13
13.999	14
14.999	15
	etc

Application of the Mason Model

The following twelve steps outline the full procedure for calculating the number of instructors required. It is best to have a sample copy of the calculation table available while reading through. Following the explanation of these steps, a sample calculation sheet has been provided.

Step 1 List all the training courses in column 1

Step 2 From the POI, determine the number of hours of lecture, theory lesson, discussion, demonstration, practical performance, special participative methods, and examinations, and enter these into column 2.

Step 3 Enter the instructor factors into column 3.

Step 4 Multiple the instructor factor (column 3) by the POI (column 2) and enter the product in column 4 (platform hours per system).

Step 5 Enter the platform factors for each type of instruction in column 5, and multiply the platform hours per system (column 4) by the platform factor (column 5). Enter the product in the subtotal column (column 6).

Step 6 Sum the entries for each system by the type of instruction (column 6), and enter the total number of instructor hours per system in column 7.

Step 7 Enter the number of classes to be taught per year in column 8, and multiply by the total number of instructor hours per system (column 7). Enter the product in column 9, instructor hours per year.

Step 8 Sum the entries in column 9 to arrive at the total instructor hour requirement.

Step 9 Multiply the instructor hour requirement per course by the Instructor Diversion Factor in box 12 to arrive at the number of instructors required, and enter this figure in column 10.

Step 10 Round off (up or down) the figures in column 10 and enter these figures in column 11.

Step 11 Multiply the total at column 9 from step 8 by the IDF in box 12 and round this off (using the table he has provided).

Step 12 Calculate the rounding off figure for the unit and place it in Box 14 from Box 13 and enter the result in Box 15.

The following page shows the calculations of Mason's original model using the figures he offers in his own explanation.

Figure B1 Demonstration of Mason's Original Model

1		POI hours *2*	Instructor factor *3*	Platform hrs per system *4*	Platfom factor *5*	Subtotal *6*	Hours per system *7*	Number of course *8*	Hours per year *9*	Instructors per cse *10*	Instructors (rounded) *11*	
Avionics Mechanics	L,C,D*	489	1	489	2	978	1579.77	11	17377.47	11.94	12	Instructor Diversion Factor
	P	244	1.553	378.9	1.3	492.57						0.000687
	SPM											
	E§	40+4	1.91	84	1.3	109.2						*Box 12*
Avionics Technicians	L,C,D*	735	1	735	2	1470	2382.379	6	14290.98	9.82	10	Grand Total Instructors for all Unit Courses
	P	370	1.351	499.87	1.3	649.831						
	SPM											
	E§	70+42	1.53	201.96	1.3	262.548						
Air Engineers	L,C,D*	80	1	80	2	160	170.4	1.33	226.632	0.16	1	
	P											
	SPM											24.11
	E§	4	2	8	1.3	10.4						*Box 13*
Air Electronics Operators	L,C,D*	90	1	90	2	180	190.4	1	190.4	0.13	1	Grand Total Instructors Non Rounded
	P											
	SPM											
	E§	4	2	8	1.3	10.4						
Avionics Technicians (CTS)	L,C,D*	735	1	735	2	1470	2692.231	1	2692.231	1.85	2	
	P	390	1.35	499.87	1.3	649.831						
	SPM	30	1	30	4	120						27
	E§	70+196+12	1.25	348	1.3	452.4						*Box 14*
Advanced Digital Techniques	L,C,D*	96	1	96	2	192	216	1.5	324	0.22	1	Rounding Off Figure
	P											
	SPM											
	E§	6	2	12	2	24						-2.994
L,C,D* refers to Lecture, Conference, Discussion; SPM refers to Special Participative methods				P refers to Practical performance; E§ refers to Examination				Totals	35101.713	24.11	27	*Box 15*

Questionnaires

Two questionnaires were used to gather data for this thesis. Samples of each are presented in the following order:

Questionnaire

This questionnaire is part of a private study investigating the change in student attitudes during military training. You are not obliged to take part in the study, if you wish, you can refuse to answer all or any of the questions. This is an anonymous questionnaire - DO NOT write your name on it. Consent for the study to use your personal data will be indicated by the completion of this form.

Trade ..... Rank .....

❑ Male ❑ Female Age .....

Please place a tick in the box that is closest to your response.

❑ ☑ ❑ ❑ ❑

Feel free to write comments in the space below the boxes if you wish to elaborate.

1. No one should be compelled to take a posting he or she does not want.

strongly agree *strongly disagree*

❑ ❑ ❑ ❑ ❑

2. What a member of the forces does in his or her off duty hours is none of the military's business.

strongly agree *strongly disagree*

❑ ❑ ❑ ❑ ❑

3. Military personnel should perform their operational duties regardless of the personal and family consequences.

strongly agree *strongly disagree*

❑ ❑ ❑ ❑ ❑

4. Differences in rank should not be important after working hours.

strongly agree *strongly disagree*

❑ ❑ ❑ ❑ ❑

5. What a member does in his or her private life should be no concern of their supervisor or commander.

strongly agree *strongly disagree*

❑ ❑ ❑ ❑ ❑

6. Personal interests and wishes must take second place to operational requirements for military personnel.

strongly agree *strongly disagree*

❑ ❑ ❑ ❑ ❑

INSTRUCTOR WORKLOAD SURVEY

1. The enclosed survey form is part of a study reviewing the method of deriving establishment numbers for instructors in RNZAF training schools. You have been selected to take part and are invited to complete this questionnaire over the next five working days.

Background.

2. The survey is interested in the current relationship between training development and classroom contact time. Previous methods of identifying establishment numbers were based on instructors performing their own training development as well as conducting assessments that they themselves had designed.

3. With the advent of testbanks, training development cells and other support facilities, it is necessary to update data in the model. While it is possible to derive instructor workloads directly from unit timetables, they do not paint the full picture. It is believed that many instructors still find themselves producing instructor guides and assisting with testbank questions despite the fact that it is outside their formal responsibilities. Another area of interest (for the development of a generalised model) is the amount of instructional planning time lost to secondary appointments.

4. It is appreciated that some smaller trade courses do not run back to back and at times instructors are employed in duties which don't appear to be in line with their primary directive. This survey is not looking at any individual performance, it is attempting to obtain a breakdown of an average instructors workload. Where necessary this will be broken into sub groups. By administering the survey to a cross section of trades and schools it is hoped that any unusual variations will be eliminated or, where large, acknowledged.

5. If you have any suggestions for improvement of the study or any questions about its completion, please contact the undersigned by leaving a message at Education Squadron. Completed forms can be sent through the runner system to the same address.

6. Because the study is anonymous, your participation in the study is optional. Completion of the survey will however, be taken as an indication of you consent for the data to be used (iaw the Human Rights Act (1993)). If you choose not to complete the study, you are requested to return the form so that it can be reused.

7. An explanation of how to complete the survey is contained on the back page.

8. Your assistance with this study is very much appreciated.

M.V.Simons
FLTLT
EDUC
29 JUN 95

Instructor Workload Questionnaire

Class Contact	Preparing / Writing	Other Unit Duties	Secondary Appointments	Other
1. Theory Lesson	8. Theory lesson - set up	16. Meetings	24. Meetings	28. Joe Break
2. Practical Lesson	9. Practical lesson - set up	17. Parades	25. Duties / Stock takes	29. Lunch
3. Practical Assessment	10. Lesson Plans	18. Inspections	26. Inspections	30. Sport / Run
4. Exam Debrief	11. Instructor Guides	19. Receiving Training	27. Inventory Duties	31. Medical
Supervision	12. Testbank Questions	20. OJT for other Instructors		32. Annual Leave
5. Theory Exam	13. Student Assignments	21. Marking exams/homework		33. Sick/Compassionate
6. Students watching a video	14. Class Handouts	22. Visitors / Tours		34. Personal Business
7. Students doing set work	15. Student Reports	23. Recovery trg for student failures		35. Other

	Monday	Tuesday	Wednesday	Thursday	Friday
0630					
0645					
0700					
0715					
0730					
0745					
0800					
0815					
0830					
0845					
0900					
0915					
0930					
0945					
1000					
1015					
1030					
1045					
1100					
1115					
1130					
1145					
1200					
1215					
1230					
1245					
1300					
1315					
1330					
1345					
1400					

NB.This page has been truncated to A4 size. Actual questionnaire was printed in landscape layout on A3 paper. Actual grid continued until 1730 hours.

Instructions

The study is in the form of a diary where you are asked to take a few moments at the end of each day to record your time spent on different activities. To simplify your task, a set of predefined categories have been provided.

To keep the process simple and because instructors in the RNZAF perform a variety of different tasks only general categories have been offered.

Where an activity does not fit into a category provided simply write it in.

Base it on your next five working days.

Example of a completed Survey Form

	Monday 0545	~~Tuesday~~	Wednesday
0630 0645	0620	DNCO call out	
0700 0715 0730 0745	11	12	
0800 0815 0830 0845	6 Air Q meeting 4	2	8
0900 0915 0930 0945	2	Run testing	10 Dentist
1000		13	

If any of your activities were particularly unusual, or did not fit one of the given categories, please identify them (as in the example above). Use the space around the sides to record any work done out of hours. Blanks within working hours will be taken as non-RNZAF activities.

To assist in sub grouping data the following information is also requested

Please tick the box that best represents your primary duty

- ❒ Instructor
- ❒ Senior Instructor
- ❒ Training Development
- ❒ Testbank Administrator
- ❒ Other...

Spreadsheets (Showing Formulae)

This appendix is provided to show the formulae versions of both the updated Mason Model and the Corporate Factor Analyser spreadsheets. For each explanation, the spreadsheets have been presented in their normal state so that cell references can be noted. These pages are then followed with a selection of necessary pages showing formulae in expanded cells. Calculations are only shown when they appear for the first time; columns which replicate formulae are omitted.

Emphasis is place on the fact that both of these models are in their *first release* state and are likely to have some minor inefficiencies/imperfections. Future releases, following extensive trials, will enhance both the user-friendliness and the power of these tools.

The Updated Mason Report

This is a revision of the original model offered by Mason[1] which provides the staffing numbers for a given training provider based on the number and type of courses offered. This appendix provides an explanation of the model by formula only. Appendix B gives a full explanation of its development and operation. The spreadsheet is presented firstly in its standard layout with cell references shown. The following page then shows the expanded spreadsheet with formulae. Columns F-G; H-I, J-K, L-M, and N-O, all replicate columns B and C respectively and have therefore been omitted.

[1] Mason (1986).

Figure D1 The Updated Mason Report Showing Cell References

	A	B	D	F	H	J	L	N	P	R
1										
2										
3	Course Name		MECH	TECH	AIRENG	AEOP	CTS	ADT	*IDF*	
4									*Military*	
5	Max No. of Cses (OLOC)		15	8	3	1	1	3	*0.00076*	
6	Number of Cses (PLOC)		11	6	1.3	1	1	1.5	*Civilian*	
7	Average Course size		25	15	6	4	6	6	*0.00058*	
8	Course Length (weeks)		19.4	30.4	2.1	2.3	35.9	2.5		
9									Platform	
10	**Theory**	**Max Size**							Factor	
11	Full Course	50							2	
12	Large Flight	30	489						2	
13	Small Flight	15		735					2	
14	Squad	8			80	90	739.5	96	2	
15	Tutoring	1							4	
16	**Practical**									
17	Large Flight	30	244						2	
18	Small Flight	15		370			30		2	
19	Squad	8					390		1.6	
20	One on One	1							2	
21	**Assessment**									
22	Theory Exam	30	40	70	4	4	82	3	1.3	
23	Practical Exam	8	4	42			196	3	1.3	
24										
25	**Total Periods**		777	1217	84	94	1438	102		
26	**Total hours per course**		1534	2403	165	185	2524	200		
27										
28		**PLOC**		**Instructor Requirements**					**OLOC**	
29	**Military**								**Military**	
30	Instructors	26	12.8	11.0	0.2	0.1	1.9	0.2	35	
31	Senior Instructors	1	0.6	0.5	0.0	0.0	0.1	0.0	1	
32	Testbank/Support	3	1.3	1.1	0.0	0.0	0.2	0.0	3	
33	**Civilian**								**Civilian**	
34	Instructors	20	9.8	8.4	0.1	0.1	1.5	0.2	34	
35	Senior Instructors	1	0.5	0.4	0.0	0.0	0.1	0.0	1	
36	Testbank/Support	2	1.0	0.8	0.0	0.0	0.1	0.0	3	

Figure D2 Page One of the Updated Mason Report Showing Formulae

	A	B	D	E	
1					
2					
3		Course Name	MECH		
4					
5		Max No. of Cses (OLOC)	15		
6		Number of Cses (PLOC)	11		
7		Average Course size	25		
8		Course Length (weeks)	=SUM(D25/40)		
9				=SUM(D6*D8)	=SUM(F6
10	**Theory**	**Max Size**			
11	Full Course	50		=SUM(IF((D$7/$B11)>1;((D$7/$B11)	=SUM(IF
12	Large Flight	30	489	=SUM(IF((D$7/$B12)>1;((D$7/$B12)	=SUM(IF
13	Small Flight	15		=SUM(IF((D$7/$B13)>1;((D$7/$B13)	=SUM(IF
14	Squad	8		=SUM(IF((D$7/$B14)>1;((D$7/$B14)	=SUM(IF
15	Tutoring	1		=SUM(IF((D$7/$B15)>1;((D$7/$B15)	=SUM(IF
16	**Practical**				
17	Large Flight	30	244	=SUM(IF((D$7/$B17)>1;((D$7/$B17)	=SUM(IF
18	Small Flight	15		=SUM(IF((D$7/$B18)>1;((D$7/$B18)	=SUM(IF
19	Squad	8		=SUM(IF((D$7/$B19)>1;((D$7/$B19)	=SUM(IF
20	One on One	1		=SUM(IF((D$7/$B20)>1;((D$7/$B20)	=SUM(IF
21	**Assessment**				
22	Theory Exam	30	40	=SUM(IF((D$7/$B22)>1;((D$7/$B22)	=SUM(IF
23	Practical Exam	8	4	=SUM(IF((D$7/$B23)>1;((D$7/$B23)	=SUM(IF
24					
25		**Total Periods**	=SUM(D11..D23)		
26		**Total hours per course**	=SUM(E11..E23)		
27					
28		**PLOC**			
29	**Military**				
30	Instructors	=(D30+F30+H30+J30+L30+	=SUM(D26*P5*D$6)	=SUM(D26*P5*D$5)	
31	Senior Instructors	=(D31+F31+H31+J31+L31+	=SUM(D30/20)	=SUM(D30/20)	
32	Testbank/Support	=(D32+F32+H32+J32+L32+	=SUM(D30/10)	=SUM(D30/10)	
33	**Civilian**				
34	Instructors	=(D34+F34+H34+J34+L34+	=SUM(D26*P7*D$6)	=SUM(D26*P7*D$5)	
35	Senior Instructors	=(D35+F35+H35+J35+L35+	=SUM(D34/20)	=SUM(D34/20)	
36	Testbank/Support	=(D36+F36+H36+J36+L36+	=SUM(D34/10)	=SUM(E34/10)	
37					

PLOC calculations

OLOC calculations

P5 is the military IDF

P7 is the civilian IDF

The Corporate Factor Analyser

This spreadsheet combines the updated Mason model with an additional section that incorporates the other costs of a course. When combined, these two parts provide the cost of a course expressed as an Equivalent Full Time Student Unit (EFTSU), or cost per student. The calculations are then replicated in six columns to represent the separate increments of the selected corporate factor. The six different values for the cost per student are then graphed to show the influence of that corporate factor.

The figure below shows the general layout of the CFA in its current form. Because of its size, it is difficult to show in full detail. The following pages show the spreadsheet, as seen by an analyst as well as a selection of pages showing formulae.

The top left quadrant reflects the general structure of the updated Mason model. The main difference being that it calculates the number of staff required to instruct a single course but under six different configurations. The bottom left quadrant is simply a list of all the operating costs for that course. They detailed in each of the six columns representing the different increments between *Efficiency* and *Effectiveness*.

Figure D3 General Layout of the Corporate Factor Analyser

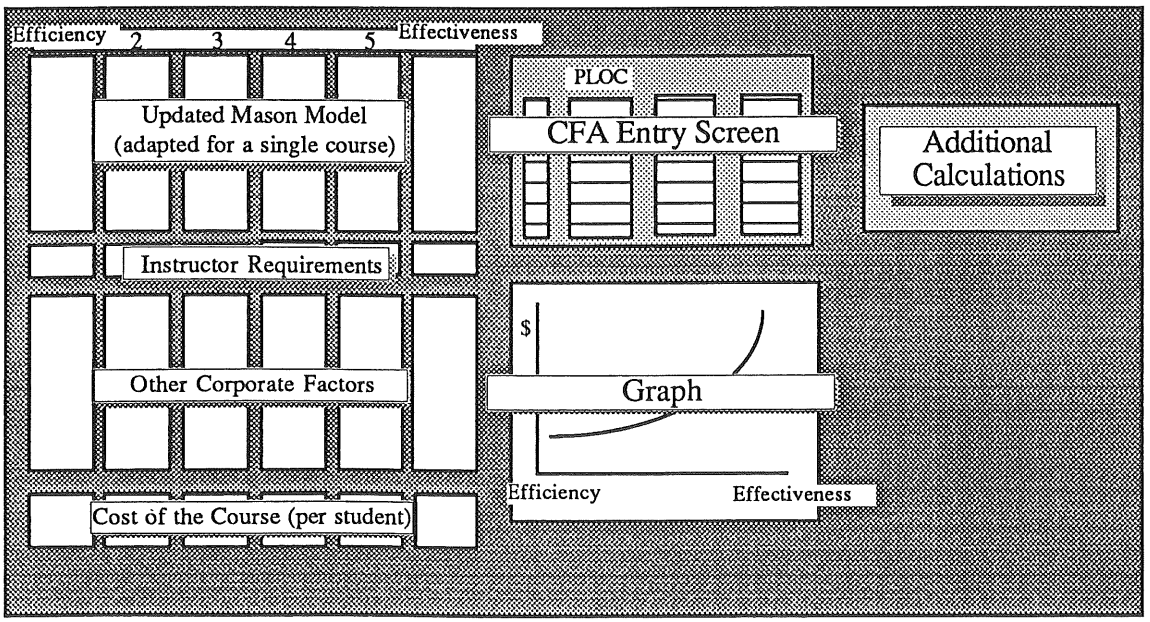


Figure D4 The Corporate Factor Analyser Showing Cell References (A1-Q40)

	A	B	C	D	E	F	G	H	I	J	L	N	Q
1													
2				NCO Instructional Techniques Course									
3													
4				Efficiency		2		3		4	5	Effectiven	IDF
5													Military
6													0.00077
7	Number of Cses (PLOC)			1		3.2		5.4		7.6	9.8	12	Civilian
8	Average Course size			5		7		9		11	13	15	0.00074
9	Course Length (weeks)			3.7		3.7		3.7		3.7	3.7	3.7	
10													Platform
11	Theory	Max Size											Factor
12	Full Course	50				0		0		0	0	0	2
13	Large Flight	30				0		0		0	0	0	2
14	Small Flight	15		100		100		100		100	100	100	2
15	Squad	8				0		0		0	0	0	2
16	Tutoring	1				0		0		0	0	0	2
17	Practical												
18	Large Flight	30				0		0		0	0	0	2
19	Small Flight	15		40		40		40		40	40	40	2
20	Squad	8				0		0		0	0	0	2
21	One on One	1				0		0		0	0	0	2
22	Assessment												
23	Theory Exam	30				0		0		0	0	0	2
24	Practical Exam	8		8		8		8		8	8	8	2
25													
26	Total Periods			148		148		148		148	148	148	
27	djusted Course Platform hrs			296		296		298		302	306	310	
28	Normal Course Platform hrs			296		296		298		302	306	310	
29								Instructor Require					
30	Military												
31	**Instructors**			**0.23**		**0.73**		**1.24**		**1.77**	**2.30**	**2.86**	
32	nior Instructors			0.01		0.04		0.06		0.09	1.1e-1	1.4e-1	
33	stbank/Support			2.279e-2		7.2e-2		1.2e-1		1.7e-1	2.3e-1	2.8e-1	
34	or Civilian												
35	**Instructors**			**0.17**		**0.55**		**0.93**		**1.33**	**1.73**	**2.15**	
36	nior Instructors			0.01		0.03		0.05		0.07	8.6e-2	1.0e-1	
37	stbank/Support			1.716e-2		3.6e-2		6.2e-2		8.8e-2	1.1e-1	1.4e-1	
38													
39													
40				Efficiency		2		3		4	5	Effectiveness	

Figure D5 The Corporate Factor Analyser Showing Cell References (A40-Q79)

	A	B	C	D	E	F	G	H	I	J	L	N	Q
40				Efficiency		2		3		4	5	Effectiveness	
41													
42	**Length**												
43	Length (in days)			18.5		18.5		18.5		18.5	18.5	18.5	
44	Hours per day			7.6		7.6		7.6		7.6	7.6	7.6	
45	Number of courses per year			1		3.2		5.4		7.6	9.8	12	
46	Number of students per cours			5		7		9		11	13	15	
47													
48	**Instructors (FTE)**												
49	Number of Instructors (UMR)			0.22792		7.2e-1		1.239		1.7673	2.3090	2.8644	
50	Supervisors			1.139e-2		3.6e-2		6.1e-2		8.8e-2	1.15e-1	1.43e-1	
51	Support Staff			2.279e-2		7.2e-2		1.2e-1		1.7e-1	2.30e-1	2.86e-1	
52													
53	**Salaries**												
54	Instructors			50000		45000		40000		35000	30000	25000	
55	Supervisor			55000		52600		50200		47800	45400	43000	
56	Support Staff			20000		20000		20000		20000	20000	20000	
57													
58	**Fixed Overheads**												
59	NZQA Liaison / External Moderation												
60	Depreciation (Plant & Equip)			11200		11200		11200		11200	11200	11200	
61	Command Support			237		237		237		237	237	237	
62	Base Support			2566		2566		2566		2566	2566	2566	
63													
64	**Variable Overheads**												
65	Consumables			7330		7330		7330		7330	7330	7330	
66	Staff/Course Development			0		2000		4000		6000	8000	10000	
67	Telephone/Comms			207		207		207		207	207	207	
68	Other			0		0		0		0	0	0	
69													
70													
71				Summary Table									
72													
73	Cost of the Course Overheads			$21540		$23540		$25540		$27540	$29540	$31540	
74	FTE Salaries			$12479		$36197		$55152		$69614	$79132	$83497	
75	Net Cost of Services			$34019		$59737		$80692		$97154	$108672	$115037	
76	Course EFTS Factor			0.2109		0.2109		0.2109		0.2109	0.2109	0.2109	
77	nt Full Time Students (EFTS)			1.0545		4.72416		10.249		17.6312	26.86866	37.962	
78	EFTSU			$32260		$12645		$7873		$5510	$4045	$3030	
79													

Figure D6 The Corporate Factor Analyser Showing Cell References (R1-Y40)

	R	S	T	U	V	W	X	Y
1			Corporate Factors	PLOC	Efficiency	Effectiveness		
2								
3			Small Class Size (max)	15	22.5	7.5		
4			Large Class Size (max)	30	45	15		
5		1	Staff Development	$0.00	$0.00	$10000.00		
6		1	Size of Course	10	15	5		
7		1	Number of Courses	8	12	1		
8			Length of Course (days)	18	9	27		
9			Enter PLOC course length ->	18				
10		1	Instructor Salaries	$38000.00	$25000.00	$50000.00		
11		1	Supervisor Salaries	$48000.00	$30000.00	$55000.00		
12			Support Staff Salaries	$20000.00	$18000.00	$30000.00		
13			Consumables per course	$916.25	$458.12	$1832.50		
14			Enter annual budget here ->	$7330.00	$3665.00	$10995.00		
15			Hours worked per day	7.6	11.4	3.8		
16			Δ to civilian Instructors	Military	Civilian	<- Alternate		
17			Theory Platform Factor	2	2.5	<- Alternate		
18			Practical Platform Factor	2	3	<- Alternate		
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

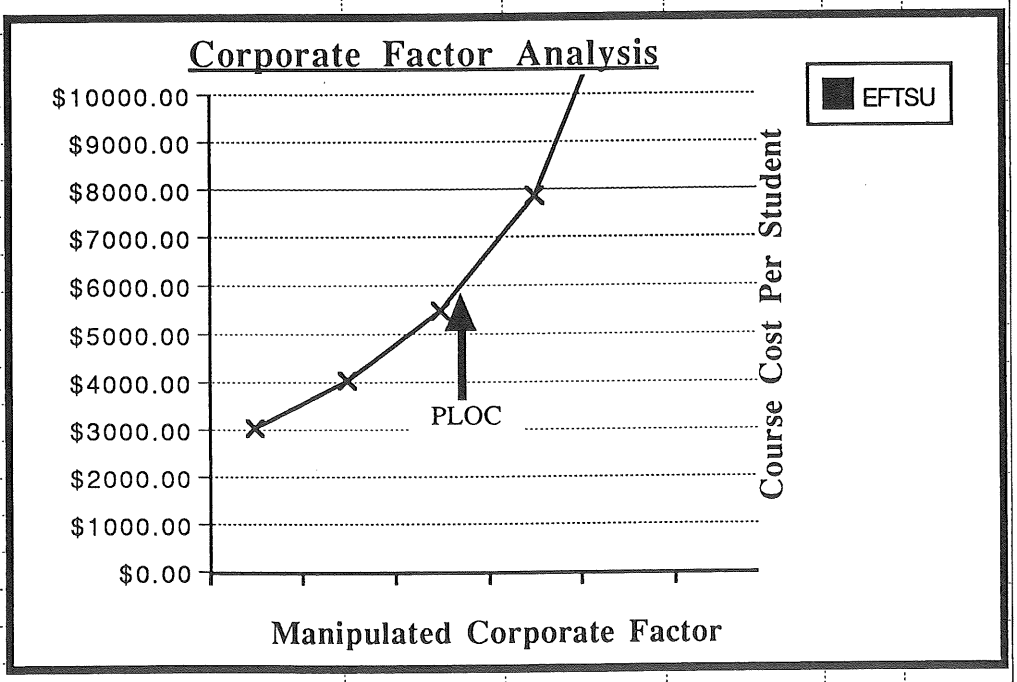


Figure D7 The Corporate Factor Analyser Showing Cell References (Y1-AF40)

	Y	Z	AA	AB	AC	AD	AE	AF
1			Efficiency	2	3	4	5	Effectiver
2								
3		Sm class	15	15	15	15	15	15
4		Lg class	30	30	30	30	30	30
5		Staff Development	0	2000	4000	6000	8000	10000
6								
7								
8								
9		Cse Length (days)	1	1	1	1	1	1
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

Figure D8 The Corporate Factor Analyser Showing Formulae (D1-E41)

	D	E
1		
2	NCO Instructional Techniques Course	
3		
4	**Efficiency**	
5		
6		
7	'=IF(S7<0;U7;V7)	
8	'=IF(S6<0;U6;V6)	
9	'=SUM(D26/40)	
10		'=SUM(D7*D9)
11		
12		'=SUM(IF((D$8/$B12)>1;((D$8/$B12)*D12*$Q12);D12*$Q12))
13		'=SUM(IF((D$8/AA$4)>1;((D$8/AA$4)*D13*$Q13);D13*$Q13))
14	100	'=SUM(IF((D$8/AA$3)>1;((D$8/AA$3)*D14*$Q14);D14*$Q14))
15		'=SUM(IF((D$8/$B15)>1;((D$8/$B15)*D15*$Q15);D15*$Q15))
16		'=SUM(IF((D$8/$B16)>1;((D$8/$B16)*D16*$Q16);D16*$Q16))
17		
18		'=SUM(IF((D$8/AA$4)>1;((D$8/AA$4)*D18*$Q18);D18*$Q18))
19	40	'=SUM(IF((D$8/AA$3)>1;((D$8/AA$3)*D19*$Q19);D19*$Q19))
20		'=SUM(IF((D$8/$B20)>1;((D$8/$B20)*D20*$Q20);D20*$Q20))
21		'=SUM(IF((D$8/$B21)>1;((D$8/$B21)*D21*$Q21);D21*$Q21))
22		
23		'=SUM(IF((D$8/$B23)>1;((D$8/$B23)*D23*$Q23);D23*$Q23))
24	8	'=SUM(IF((D$8/$B24)>1;((D$8/$B24)*D24*$Q24);D24*$Q24))
25		
26	'=SUM(D12..D24)	
27	'=SUM(D28*AA9)	
28	'=SUM(E12..E24)	
29		
30		
31	'=SUM(D27*Q6*D$7)	
32	'=SUM(D31/20)	
33	'=SUM(D31/10)	
34		
35	'=SUM(D27*Q8*D$7)	
36	'=SUM(D35/20)	
37	'=SUM(D35/10)	
38		
39		
40	**Efficiency**	
41		

Figure D9 The Corporate Factor Analyser Showing Formulae (F1-G41)

	F	G
1		
2		
3		
4	2	
5		
6		
7	'=IF($S7<0;D7;((($W7-$V7)/5)+D7))	
8	'=IF($S6<0;D8;((($W6-$V6)/5)+D8))	
9	'=SUM(F26/40)	
10	'=SUM(D7*D9)	'=SUM(F7*F9)
11		
12	'=SUM($D12)	'=SUM(IF((F$8/$B12)>1;((F$8/$B12)*F12*$Q12);F12*$Q12))
13	'=SUM($D13)	'=SUM(IF((F$8/AB$4)>1;((F$8/AB$4)*F13*$Q13);F13*$Q13))
14	'=SUM($D14)	'=SUM(IF((F$8/AB$3)>1;((F$8/AB$3)*F14*$Q14);F14*$Q14))
15	'=SUM($D15)	'=SUM(IF((F$8/$B15)>1;((F$8/$B15)*F15*$Q15);F15*$Q15))
16	'=SUM($D16)	'=SUM(IF((F$8/$B16)>1;((F$8/$B16)*F16*$Q16);F16*$Q16))
17		
18	'=SUM($D18)	'=SUM(IF((F$8/AB$4)>1;((F$8/AB$4)*F18*$Q18);F18*$Q18))
19	'=SUM($D19)	'=SUM(IF((F$8/AB$3)>1;((F$8/AB$3)*F19*$Q19);F19*$Q19))
20	'=SUM($D20)	'=SUM(IF((F$8/$B20)>1;((F$8/$B20)*F20*$Q20);F20*$Q20))
21	'=SUM($D21)	'=SUM(IF((F$8/$B21)>1;((F$8/$B21)*F21*$Q21);F21*$Q21))
22		
23	'=SUM($D23)	'=SUM(IF((F$8/$B23)>1;((F$8/$B23)*F23*$Q23);F23*$Q23))
24	'=SUM($D24)	'=SUM(IF((F$8/$B24)>1;((F$8/$B24)*F24*$Q24);F24*$Q24))
25		
26	'=SUM(F12..F24)	
27	'=SUM(F28*AB9)	
28	'=SUM(G12..G24)	
29		
30		
31	'=SUM(F27*Q6*F$7)	
32	'=SUM(F31/20)	
33	'=SUM(F31/10)	
34		
35	'=SUM(F27*Q8*F$7)	
36	'=SUM(F35/20)	
37	'=SUM(F35/15)	
38		
39		
40	2	
41		

Figure D10 The Corporate Factor Analyser Showing Formulae (A40-F79)

	A	D	F
40		**Efficiency**	2
41			
42	**Length**		
43	Length (in days)	'=SUM(D26/8)	'=SUM(F26/8)
44	Hours per day	'=IF(S15>0;V15;U15)	'=IF($S15>0;(($W15-$V15)/5)+D44);D44)
45	r of courses per year	'=SUM(D7)	'=SUM(F7)
46	f students per course	'=SUM(D8)	'=SUM(F8)
47			
48	**nstructors (FTE)**		
49	f Instructors (UMR)	'=IF($S16>0;D35;D31)	'=IF($S16>0;F35;F31)
50	Supervisors	'=SUM(D32)	'=SUM(F32)
51	Support Staff	'=SUM(D33)	'=SUM(F33)
52			
53	**Salaries**		
54	Instructors	'=IF(S10>0;W10;U10)	'=IF($S10>0;(ABS((($W11-$V11)/5)-D54));D54)
55	Supervisor	'=IF(S11>0;W11;U11)	'=IF($S11>0;(ABS((($W12-$V12)/5)-D55));D55)
56	Support Staff	'=IF(S12>0;W12;U12)	'=IF($S12>0;(ABS((($W13-$V13)/5)-D56));D56)
57			
58	Fixed Overheads		
59	External Moderation		
60	ion (Plant & Equip)	$11,200	'=SUM($D60)
61	Command Support	$237	'=SUM($D61)
62	Base Support	$2,566	'=SUM($D62)
63			
64	iable Overheads		
65	Consumables	'=IF(S14>0;(V14);(U14))	'=IF($S14>0;((ABS(($U14-$V14)/5))+D65);$D65)
66	Course Development	'=SUM(AA5)	'=SUM(AB5)
67	Telephone/Comms	$207	'=SUM($D67)
68	Other	$0	'=SUM($D68)
69			
70			
71			
72			
73		'=SUM(D59..D68)	'=SUM(F59..F68)
74		'=SUM((D54*D49)+(D50*D55)+(D51*	'=SUM((F54*F49)+(F50*F55)+(F51*F56))
75		'=SUM(D73..D74)	'=SUM(F73..F74)
76		'=SUM((D43*D44)*(0.0015))	'=SUM((F43*F44)*(0.0015))
77		'=SUM(D45*D46*D76)	'=SUM(F45*F46*F76)
78		'=SUM(D75/D77)	'=SUM(F75/F77)
79			

Figure D11 The Corporate Factor Analyser Showing Formulae (T1-W39)

	T	U	V	W
1	Corporate Factors	PLOC	Efficiency	Effectiveness
2				
3	Small Class Size (max)	15	'=SUM(U3*1.5)	'=SUM(U3*0.5)
4	Large Class Size (max)	'=SUM(U3*2)	'=SUM(U4*1.5)	'=SUM(U4*0.5)
5	Staff Development	$0	$0	$10,000
6	Size of Course	10	'=SUM(U6*1.5)	'=SUM(U6*0.5)
7	Number of Courses	8	12	1
8	Length of Course (days)	'=IF(S15>0;U9;U9)	'=SUM(U9*0.5)	=SUM(D10*1.5)
9	Enter PLOC course length ->	18		
10	Instructor Salaries	$38,000	$25,000	$50,000
11	Supervisor Salaries	$48,000	$30,000	$55,000
12	Support Staff Salaries	$20,000	$18,000	$30,000
13	Consumables per course	*'=SUM(U14/U7)*	*'=SUM(U13*0.5)*	*'=SUM(U13*1.5)*
14	Enter annual budget here ->	$7,330	*'=SUM(U14*0.5)*	*'=SUM(U14*1.5)*
15	Hours worked per day	7.6	'=SUM(U15*1.5)	'=SUM(U15*0.5)
16	Δ to civilian Instructors	Military	Military	Civilian
17	Theory Platform Factor	2	2.5	<- *Alternate*
18	Practical Platform Factor	2	3	<- *Alternate*
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

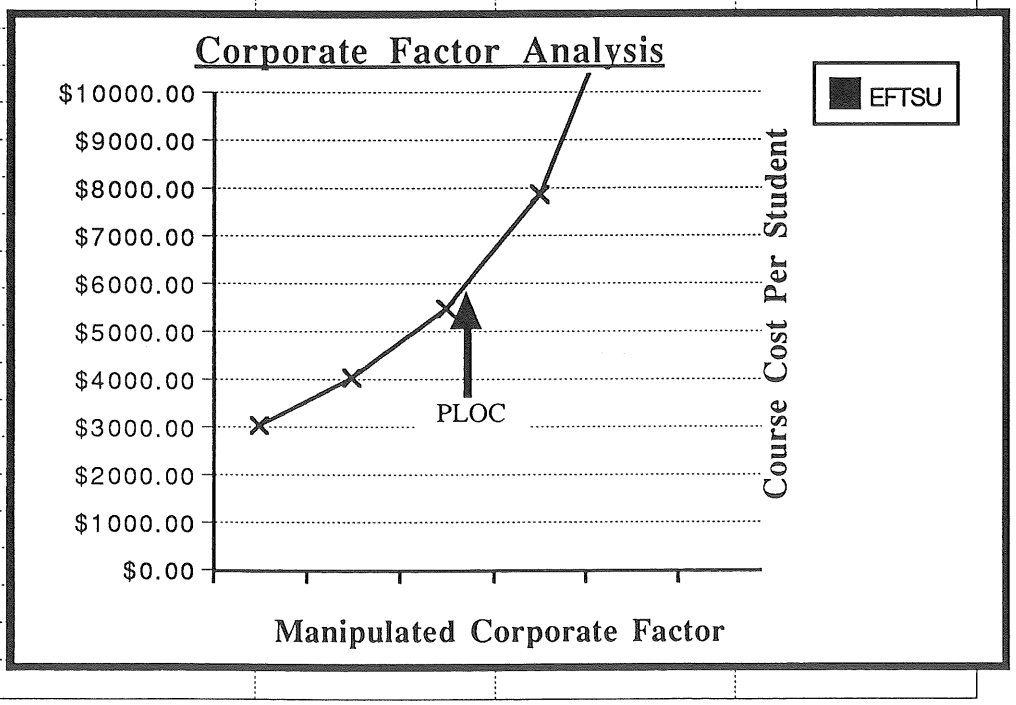


Figure D12 The Corporate Factor Analyser Showing Formulae (Y1-AB14)

	Y	Z	AA	AB
1			Efficiency	2
2				
3		Sm class	'=IF(S3>0;V3;U3)	'=IF($S3>0;ABS((($W3-$V3)/5)+AA3);$U3)
4		Lg class	'=IF(S4>0;V4;U4)	'=IF($S4>0;ABS((($W4-$V4)/5)+AA4);$U4)
5		Staff Development	'=IF(S5>0;V5;U5)	'=IF($S5>0;ABS((($W5-$V5)/5)+AA5);$U5)
6				
7				
8				
9		Cse Length (days)	'=IF($S9>0;1.5;1)	'=IF($S9>0;1.3;1)
10				
11				
12				
13				
14				

The calculations in columns AA through to AF provide data necessary for variations in corporate factors that are not available from the main formulae in columns A-N.

Columns AC through to AF replicate the formulae of column AB and have therefore been omitted.

Validation of Cotton's Military Ethos Scale

To validate the use of the MES as an instrument for measuring loyalty in RNZAF personnel, the following analysis has been provided.

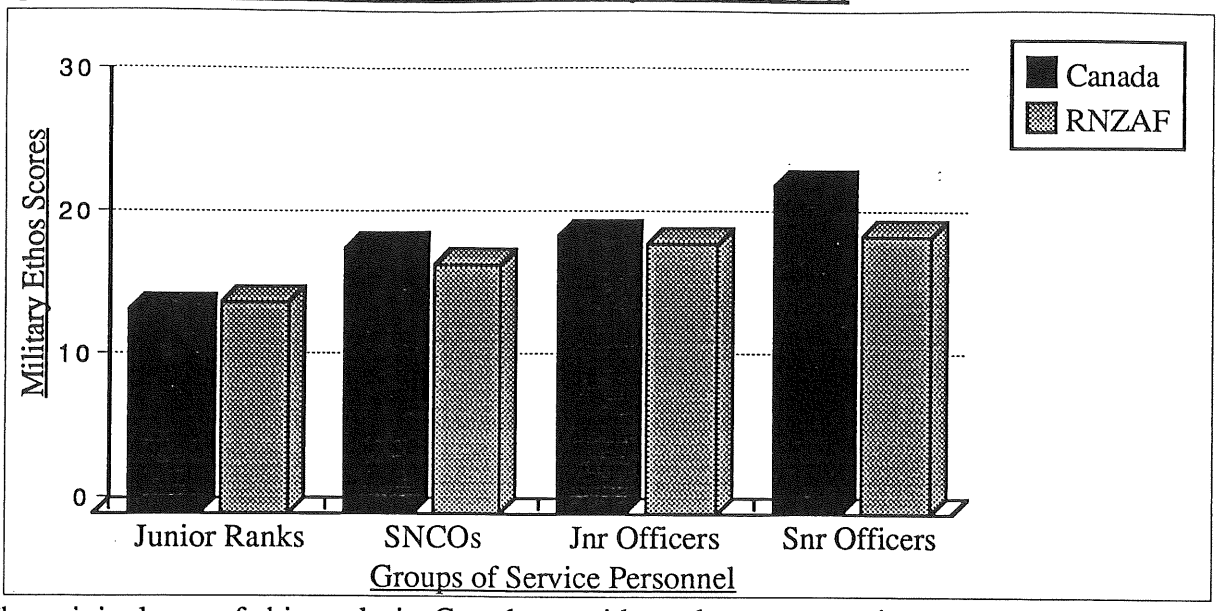
The following table shows a comparison between the Canadian Army and the RNZAF. These figures are shown only to give some meaning to the Military Ethos Scale (MES). Care should be taken when comparing the two militaries because they perform completely different tasks. There is also a 15 year gap between the two studies.

Table E1 Cotton and RNZAF Scores Contrasted

	Canadian Army (1979)			RNZAF (1995)		
Category	*Mean*	*S.D.*	*N*	*Mean*	*S.D.*	*N*
Senior combat officers	25.0	3.5	59			
Senior support officers	22.9	4.2	47	19.5	3.5	10
Junior combat officers	22.5	4.3	173			
Junior support officers	19.4	4.9	184	18.9	3.4	23
Senior combat NCOs	20.0	4.2	228			
Senior support NCOs	18.6	5.0	208	17.5	3.7	54
Junior combat troops	14.1	4.1	399			
Junior support troops	14.2	4.3	338	14.9	4.1	92
Total	17.70		1530	16.40		169

The results for the RNZAF have not been divided into support and combat roles due to the lack of combat units/trades.

Figure E1 Canadian and RNZAF Military Ethos Scores



The original use of this scale in Canada provides a loose comparison set of data. Although Cotton's study used a completely different type of military (the role and expectations of the Canadian Army are quite different to those of the RNZAF), the data are still of interest. The Canadian scores were expected be higher than those in New Zealand. Consideration should also be given to the fact that Cotton's survey was conducted late in 1978 - early 1979; changes to world politics and substantial downsizing of western militaries have had a profound affect on attitudes and expectations.

With the above points taken into account, the slight differences in ethos scale scores suggest that the scale is a valid instrument for use in the RNZAF.